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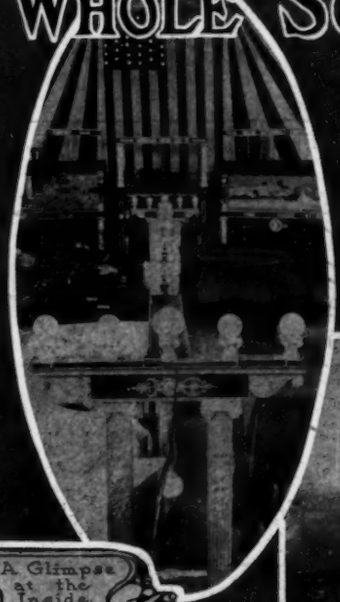
THE AUTOMOBILE

ATLANTA'S NATIONAL SHOW INTERESTS THE WHOLE SOUTH

Mayor Maddox, Asa S. Candler, Clark Howell and other Members of the Chamber of Commerce who Officially Opened the Show



A Glimpse at the Inside

Exterior View of the Auditorium Armory Where Show Is Being Held

ATLANTA, GA., Nov. 8—This wideawake city is undoubtedly the busiest place in the whole South, and the coming of automobiles explains the whyfore. In giving the "Gate City" a National Show the N. A. A. M. acted wisely, for the event has involved the pride of the municipality, which is exceedingly great, and involves the inhabitants as a whole, besides all officialdom and a thoroughly surcharged press. Such universal enthusiasm is a revelation to the follower of the show circuit whose experiences began with that exhibition in New York's big amphitheater when the bicycle grudgingly gave not much more than a corner to the rival who soon gained the center of the stage in prodigious bounds.

When the new Auditorium-Armory opened its doors on Saturday afternoon last and invited the public to have its first look at the segregation of 1910 models, the persistent efforts of Managers Miles and Reeves had netted the installing of all exhibits but three, with decorations complete and artistic. The prevailing colors are red and white, and a plenteous use of American flags, the effect being pleasing and enlivening, and further embellished in the main hall with paintings depicting the automobile in varied settings.

Of course, all could not have spaces in the heart of the building, and considerable ingenuity had to be employed to take full advantage of all the opportunities scattered about the structure, which, however, is being explored to its most in-

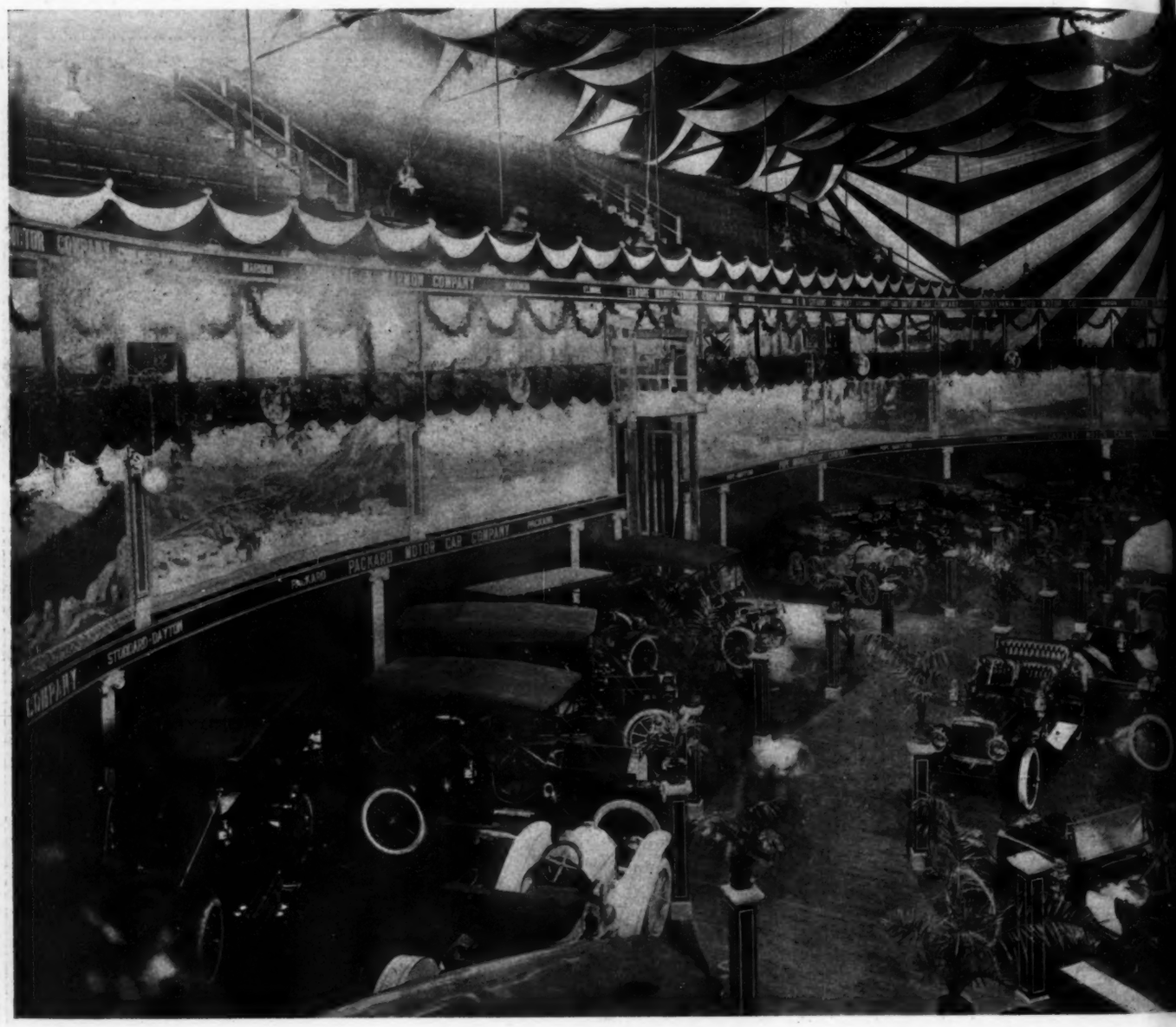
accessible parts by seekers for automobile information and instruction, for please keep it in mind that this is the first National Show ever held in the South, and the aforesaid South is filling Atlanta's hotels and rooming houses to full capacity.

Down here, coincident with the resultful cry for good roads, is the buying of autos to travel over the highways before they are built. Again, while it is true that the cotton crop is only a two-thirds one, the Georgia yield is in excess and the deficiency is in Texas, and with the price hovering around 15 cents there is going to be some sixty million dollars ahead of previous years. The deduction is that there will be some dollars with which to buy autos; and the large attendance is an indication that the prophesy stands an excellent chance of fulfillment. Before the show was a day old there came the usual reports of sales, and, discounting the zeal of the salesmen, there remains enough fact to prove the wisdom of those who argued in favor of a Southern display of up-to-date models.

In the opening of the show on Saturday afternoon there were some introductory festivities such as are dear to the heart of the Southron, which means that speeches figured therein with musical accompaniment. Mayor Maddox contributed the words of welcome in language befitting the occasion, followed by Asa G. Candler, president of the Chamber of Commerce, who was flanked by prominent members of that body. These included a notable contingent of the leading business men of the city, prominent among them being Clark Howell, editor of the Atlanta *Constitution*, and one whose efforts did much toward bringing a National Show to Atlanta.

Asa Candler is an Atlantian who has hewed his way to success and fortune, and now he is ever ready to do big things for his home city, though the story of his life tells of Georgia "Cracker" antecedents. But now he is rated by many as Atlanta's best asset from a business standpoint, and his belief in the place is indicated by his enormous real estate holdings. In the course of his speech opening the show Mr. Candler said:

"Atlanta's automobile exposition marks an era in the development of the wealth and in the quickening of the progress of the Southeastern States. When the matter was proposed we undertook to make it an exposition such as no city of equal size in the world has ever had. We are here assembled to formally open this exposition in the fulfillment of that purpose. This exposition is setting forth in motion forces which will do more for the construction of good roads than has hitherto been accomplished. To increase interest in the exposition two great newspapers undertook to locate a great national highway, over which a successful contest tour has taken place from New York City to Atlanta. Another.



In the Vast Amphitheatre of the Atlanta Auditorium-Armory, Where This Week is

great paper of this city has aroused marked enthusiasm in roads building by inaugurating a series of tours from every part of the State to the capital. In furtherance of the same great end, and moved by an impulse characteristic of Atlanta's great public-spirited citizens, a company has constructed a speedway unsurpassed, if indeed we may not say unequalled, by any similar track in the world.

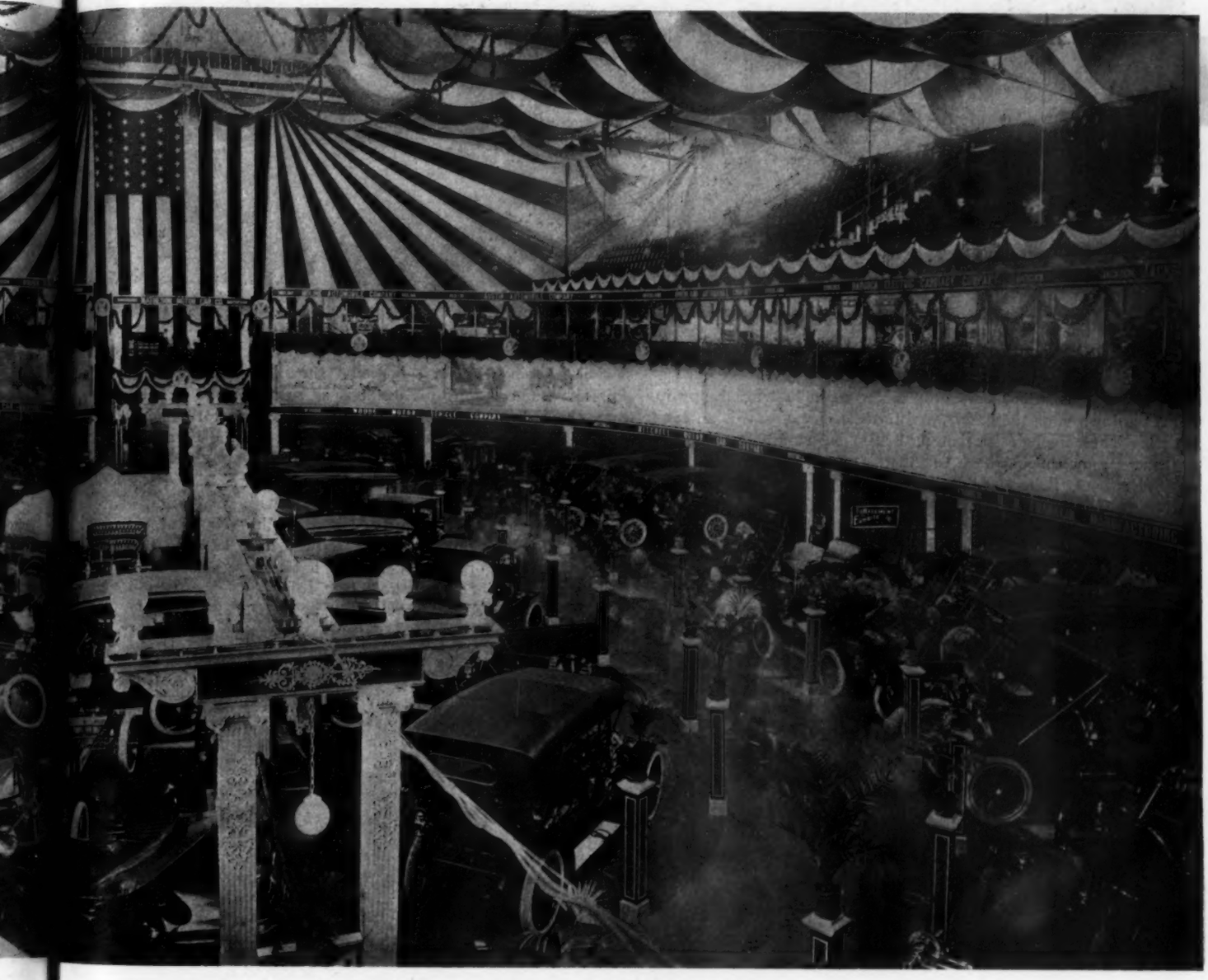
"If time permitted it would not be difficult to show that influences flowing from this exposition will promote more general and intimate association and a better understanding among the people. Distance divides, and that which sets distance aside begets acquaintance, which in the end ripens into friendship. Antipathy between town and country is removed when a method is found, and has come into common use, which brings the people from the country to the town quickly and safely, and sends the townsmen into the country with equal speed and facility. It was but yesterday when it was scarcely safe to operate an automobile in some parts of the country, so great was the prejudice against the horseless carriage. This prejudice is rapidly passing; in fact, is about gone. The people are coming to see that the automobile is an admirable and efficient instrument for promoting both the happiness and usefulness of their families. Besides the contribution which the automobile may thus make to the improvement of family and social life, it will do more to increase the wealth of the country. Man can never be in two places at the same time, nor command the sun to stand still; but by this invention he can cover more ground between suns and thereby bring more things to pass before dark."

Following the speechmaking the Fifth Regiment band played in succession "America," the "Star-Spangled Banner" and "Dixie," the latter selection, of course, evoking the real thing in the way of the old Rebel yell. Then the show was in full swing.

All this happened in the afternoon with a full house, which was renewed in the evening with an even larger attendance, though in connection therewith it was to be noted that the Atlantians are early seekers of their beds, for by shortly after 10 o'clock the crowd had thinned out most perceptibly.

In the main hall the luckiest drawers of spaces were Peerless, Oldsmobile, Ford, Premier, Pierce and Winton, which makes occupy the center. Around the outer circle are Cadillac, Pope-Hartford, Packard, Stoddard-Dayton, Maxwell, Stevens-Duryea, Franklin, Mitchell and Woods, while under the tiers of seats are Ohio, Studebaker, Selden, McIntyre, Standard, Columbus, Cartercar, Moon, Metz, Rauch & Lang, Renault, Hupmobile and Speedwell. In Taft hall there is a comfortable arrangement of Glide, Rambler, Reo, White, Locomobile and Mora.

Attracting immediate attention as one enters the building in the main lobby are Marion, Knox and Lambert. Down in the basement are the ones who rate themselves unfortunate, but there is light and room. This contingent includes Petrel, Wav-



yed the Choicest Products of America and Europe's Leading Automobile Manufacturers

Looking Down the Aisle in One Section of the Mezzanine Floor Where Many Prominent Exhibitors Had Space

erly, Streator, Sultan, F-A-L car, Cole, Inter-State, Great Western, Randolph, Autocar, Black and Rapid.

The mezzanine floor occupants in the main hall are happy in looking down upon the others, and to their elevation it is an easy climb. These include Matheson, Brush, Pennsylvania, Hudson, Stearns, Elmore, Marmon, Chalmers-Detroit, Pullman, Apperson, National, Baker, Jackson, Babcock, Overland, Austin and Moline. The entire list makes clear that the show is a representative one of the industry, and the South is not having a look at a skimpy lot of cars, for scarcely a name of note is among the missing.

In the accessory division it was not to be expected that the list would be complete, though leaders in each line are to be seen. But the patrons of the show are to be observed spending a goodly amount of time at the accessory booths which are scattered here and there to fill in any advantageous opening left over after the car allotments had been attended to.

Commenting upon the show now in progress, Manager S. A. Miles had this to say:

"The manufacturers are looking forward to a satisfactory business during this first National show in Atlanta, and it is fair to assume that if the event is as successful as they anticipate, the industry will be called upon to support three instead of two annual National events—New York for the East, Atlanta for the South, and Chicago for the West."

Telling of the preparations for the show here, Alfred Reeves, who has shared the management jointly with Mr. Miles, gives facts and figures that compare with the other National exhibitions. "Handling an automobile show simply adds to the old story of perfect organization, made a bit more difficult by the fact that plans for these affairs are somewhat of a temporary sort, hastily devised and carried out by men trained quickly for their work, somewhat as artists are trained for a big stage production put on after a short rehearsal. Since the adoption of uniform decorations the work of preparation has been greatly reduced, and the beauty of the exhibition as a whole has been increased most perceptibly. This show is effectively neat and artistic."

HOW ATLANTA ENTERTAINS HER AUTOMOBILE GUESTS

ABILITY to meet unusual conditions has always distinguished Atlanta and her people, but no better instance of their readiness can be recalled than the preparations that have been made for the guests of automobile week. The Chamber of Commerce was the rallying center, but President Asa G. Candler called a meeting of business men irrespective of membership. Committees were appointed on information and public comfort, public safety, and entertainment, and liberal appropriations were made for their use.

The committee on information assumed the duty of finding lodgings for the visitors. Local newspapers contributed space for announcements urging those willing to take boarders to send in their names. These notices, however, brought replies offering accommodations for but one thousand people. Then canvassers were sent out. They visited every reputable residence portion of the city within two blocks of a car line. Each canvasser was armed with blanks, which he filled out at the dictation of the householder. The particulars recorded were the family name, street number, nearest car line and cross street at which the visitor should alight, whether or not meals would be furnished, and the price of lodging or the price of meals and lodging. Those who could offer storage for one or more automobiles were also listed.

The canvassers visited about 3,500 homes, and with rare exceptions met with interested listeners. The result of their efforts is that more than 2,800 homes, besides regular boarding houses, were opened to visitors, and quarters for more than 10,000 people have been provided outside of the hotels. The information was tabulated in such a way that it was but the work of a few seconds to refer an applicant to half a dozen names in any desired neighborhood and at any price. In the hands of Chairman S. C. Dobbs and Secretary G. M. Chapin this information bureau has given invaluable service.

The public safety committee has had in charge the protection both of the citizens and of their guests from the professional pickpockets and criminals who are always attracted to such gatherings. Naturally, the work of this committee cannot be made public, but its efficiency has already been made plain. This committee consists of John E. Murphy, chairman; Carlos Mason, J. L. Barnes and John J. Woodside.

SOME RANDOM OBSERVATIONS OF ATLANTA'S SHOW

NOT AS RADICAL as many of the more conservative expected is the 1910 crop of new models. Of the cars on exhibition in the Auditorium there is not one case of a maker who exhibited a year ago having made such startling alterations that one cannot recognize his product at a glance. In some cases a new type of motor has been fitted, with the transmission system left unaltered; in others the motor has not been disturbed, but an improved axle has been added; and again, in not a few cases, the lubrication of the motor has been changed or a new carbureter added.

There is very little of the upsetting of old lines and the launching of new ones that was so common a few seasons ago. At that time it was imperative for many makers to turn completely about in order to remain on the market. The trouble with not a few of them was that previously their cars were the conceptions of one individual who refused to change until the salesmen began to resign in despair.

A maker two or three seasons ago deemed it necessary to have something different in order to sell; but to-day a designer or sales manager does not show even the semblance of a blush in acknowledging: "We have not tried to make anything freakish; we have aimed to take what other makers have proved reliable and better it in detail." This is a good indication, for it shows that the makers have confidence in one another, and are willing to admit that the other factory, too, can build cars.

Trustworthy Inferences Possible—In a general résumé of the tendencies as revealed in this show it is well to bear in mind that conclusions from them can be regarded as fairly correct, because nearly all of the old-time makers are on hand. There are 153 cars on exhibition, with three or four exhibits not yet installed. Besides this number of cars with varied types of bodies, two dozen polished chassis are in place. Not so many chassis are shown as will be on hand at Chicago and New York, as such firms as Packard, Pierce, Peerless, Stevens-Duryea and Mitchell are not exhibiting them here, although they have conscientiously displayed them at other national shows. On the other hand, Locomobile shows a highly finished chassis of the shaft-driven model, obtaining a beautiful effect through the combination of polished, painted and brass-finished surfaces. Other spaces showing chassis are those of Stearns, Chalmers-Detroit, Marmon, Winton, Elmore, White, Rambler, Mora, Premier, Oldsmobile, Inter-State, Lambert, Reo, Speedwell, Selden, Standard, Studebaker, Pennsylvania, Hudson, Cole, Carter, Hupmobile and Rapid trucks.

Toy Tonneaus Find Favor—The percentages of bodies favor the present type of five-passenger touring car, but the miniature or toy tonneaus are as prominent now as the roadster types were two years ago. The three-passenger roadster or speed car is not much in evidence, not a dozen of them being shown. This would indicate that the uncomfortable rumble seat has at last fallen from favor. On the other hand, the toy tonneau has progressed and the close-coupled body is growing stronger.

In visiting the many booths it is difficult to name the different types of bodies to suit the several salesmen. In some cases a certain design is designated a close-coupled in one stand and a

From the Mezzanine Floor the View Was Inspiring, a Grand Circle of Signs Encompassing the Whole Auditorium

toy tonneau in the next; whereas, a glance shows the tonneau accommodation in each to be two and the rear seat's relation to the rear axle is identical in each. A type of body that is gaining in favor is the four-passenger surrey, this being but a tonneau without doors and with a lower back and sides.

This makes a light type of car, with good seating space.

Tops are generally shown, more than heretofore, and windshields are being made a standard part of the equipment more than heretofore. Not a few makers are adding their own type of windshield, and others have arranged with a windshield maker to build a special type for them best suited to the car's design.

The equipment story might be carried to the lamp, horn, and gas tank realm, all of which are now stock on many cars which heretofore charged extra for them. The double gas headlights are being added in many cases. Stearns is attracting attention because it fits as stock Continental demountable rims. This marks a new epoch in equipment, although some cars, notably the Knox, have been equipping Fisk demountables this year as

"Atlanta at the Wheel This Week!"
—From the "Atlanta Constitution."

stock. Shock absorbers are being furnished on many of the highest prices machines, and one maker, Winton, has added an absorber of home design and make. This action suggests a new angle in the line of equipment.

Improvements in Running Gears—In analyzing the chassis, the running gears naturally present themselves first. For next year frames are invariably heavier; by this is meant that the channel steel side members are made with a greater vertical depth, the channel lips are wider, and not infrequently the stock is 1-32 heavier. A commendable change is the increase in the size of gusset plates at the angle where cross pieces unite with the side members of the frame. These gusset braces are generally stamped integrally with the cross piece and are large, offering real strength.

The dropped frame is now general. Three years ago when Peerless showed this type of frame little imitation was indulged in, but last year it got good assistance and this year has witnessed a veritable landslide to it; so great in fact, that now the cheapest price model has it, and any new car must perforce adopt it. The drop is invariably in advance of the rear axle and varies from two to three inches. Chalmers and the Stearns 15-30 have adopted the double drop, the Stearns having brought out this with the advent of the small car a year ago.

Hand in hand with the drop frame is the three-quarter elliptic rear spring. This type is taking the place of the semi-elliptic type in rear, but it is very noticeable that those makers who have used the platform type for several years are slow in changing, so that the prestige of the platform is equally as strong as it was a year ago. Peerless, Stevens-Duryea on its six-cylinder model, Mitchel also on its six, Mora, Ohio, Standard, Studebaker-Garford, and the National six are a few examples of the use of the platform spring.

Compared with these, however, is a long line of three-quarter devotees, including Pierce, Stoddard, Oldsmobile, Premier, Reo, Inter-State, Pennsylvania, Hudson, Stearns, Elmore, Chalmers, National four, Matheson, Overland, -F-A-L- Car, Mitchel fours, Maxwell model E, and Stevens-Duryea XX. The Oldsmobile has changed from full elliptic to the three-quarters; Stoddard has changed from the semi-elliptic, and, in fact, the majority of the three-quarter converts move from the semi-elliptic class. Jackson continues to use full elliptics in front and rear, as does the Franklin and Maxwell, Cole, Lambert, Black-Crew, Marion, Reo two-cylinder types, Marmon, Overland, and E.M.F. are examples of the full elliptic type. On the Ford the tranverse spring in front and rear is continued. The Ramblers are fitted with triple action springs in the rear, and the Brush runabout uses the four vertical coal springs, one at each corner, acting as they do in conjunction with shock absorbers.

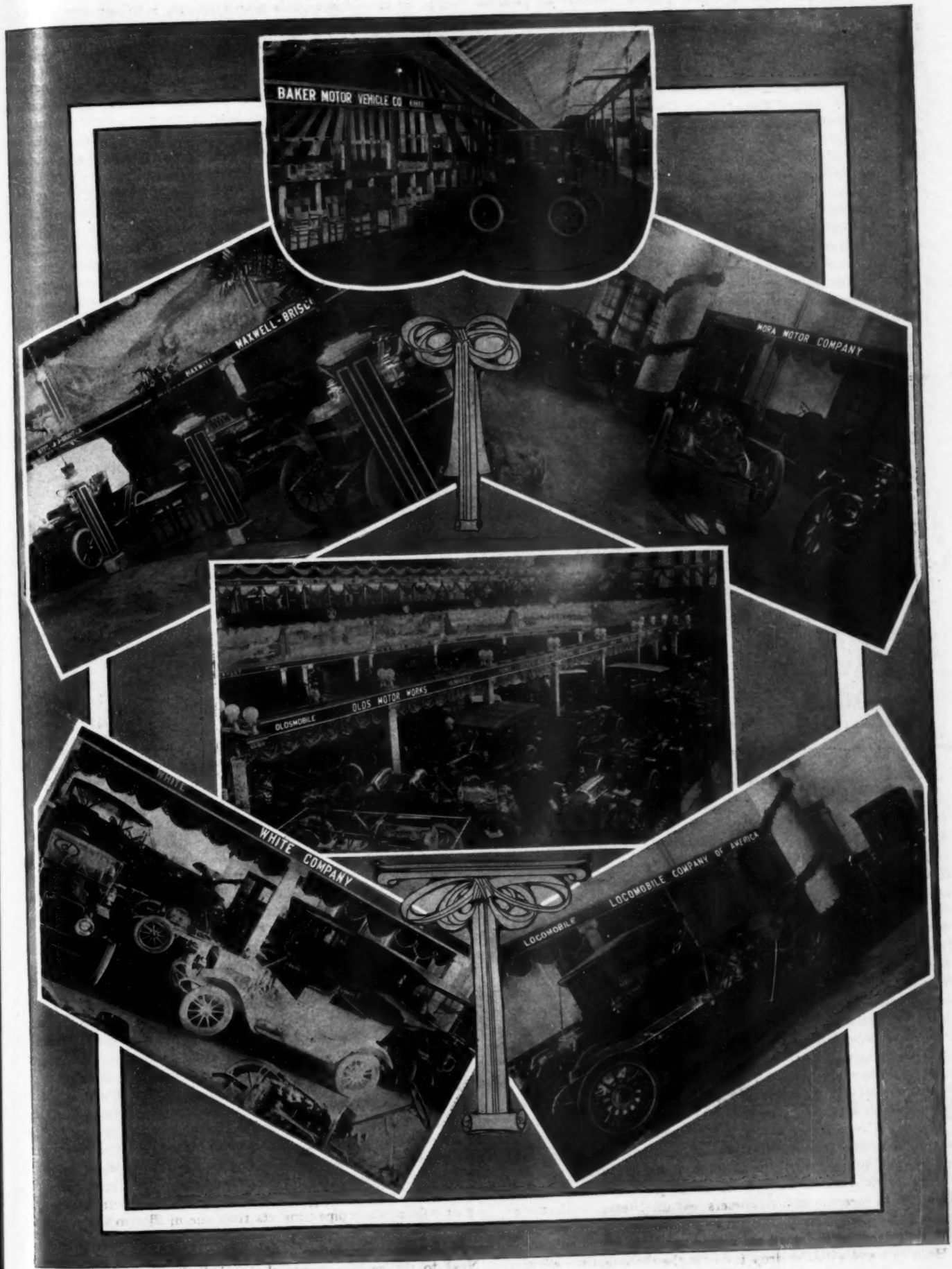
An Era of Big Wheels—The Oldsmobile "Limited" sets the pace for big wheels, this six-cylinder car carrying 42 by 4½-inch tires in front and rear. Next comes the Pierce 6-66 with 37 by 5-inch tires in front and 38 by 5½-inch in rear. On the 6-48 Pierce 37 by 5-inch sizes are used in rear with the standard 36-inch in front. These constitute the only examples of big tires, but there are scores of examples of other machines that have promoted themselves from the 32 to the 34-inch class; and others advancing from the 34-inch ranks to the 36. This has been a year of large tires, and next year gives promise of eclipsing it.

The motor situation is changing very slowly. In the $2,000 to $3,000 class there has been not a little increasing of the bore and lengthening of the stroke. It is questionable what has prompted this, and it may be that the present classifications of cars for contests by cylinder volume, as decided upon by the Manufacturers' Contest Association, has had not a little to do with this. At least it may be designated a coincidence that so many of the new sizes come closer to this classification limit, but few if any cases are on record where the increase of motor size has promoted the car into a higher class.

Prominence of the Long Stroke—The long stroke is gaining in favor. The new White gasoline car has set the pace in this respect, with its bore of 3 3-4 inches and a 5 1-8-inch stroke. This is in direct accord with European dictates at the present time. Not a few other makers have altered their motors to bring them into the long-stroke category. One example is the Premier, in which the stroke has jumped from 4 1-2 to 5 1-4 inches, with the bore remaining at 4 1-2 inches. In a rather graphic way this has resulted in giving a car which with the longer stroke gives as good service on a 3 1-2 to 1 gear ratio as it used to give on a 4 to 1.

One of the most pronounced motor trends is that toward forming four cylinders in one casting, *en bloc* as the Frenchman calls it. Ford led off with this construction, but now there are seven makers showing it, with a total of 22 cars on exhibition. These include, in addition to the Ford, such names as Chalmers 30, Stearns 15-30, White, Hudson, Lambert, and Black-Crow. All motors of this design bear a striking similarity to one another, because of the lack of intake, exhaust, and water piping. All of them are of the L-type, having both sets of valves on one side, excepting the Chalmers, which has the intakes located in the cylinder heads and opened by a rocker-arm action. The new White encloses both the intake and exhaust manifolds, so that only a single pipe connects from the muffler to the cylinders and but one inlet pipe is seen. Nearly all of these motors use forced water circulation.

Next to the *en bloc* comes the six-cylinder type. It cannot


BAKER MOTOR VEHICLE CO
MAXWELL-BRISCOE
MORA MOTOR COMPANY
OLDSMOBILE
OLDS MOTOR WORKS
WHITE
WHITE COMPANY
LOCOMOBILE
LOCOMOBILE COMPANY OF AMERICA

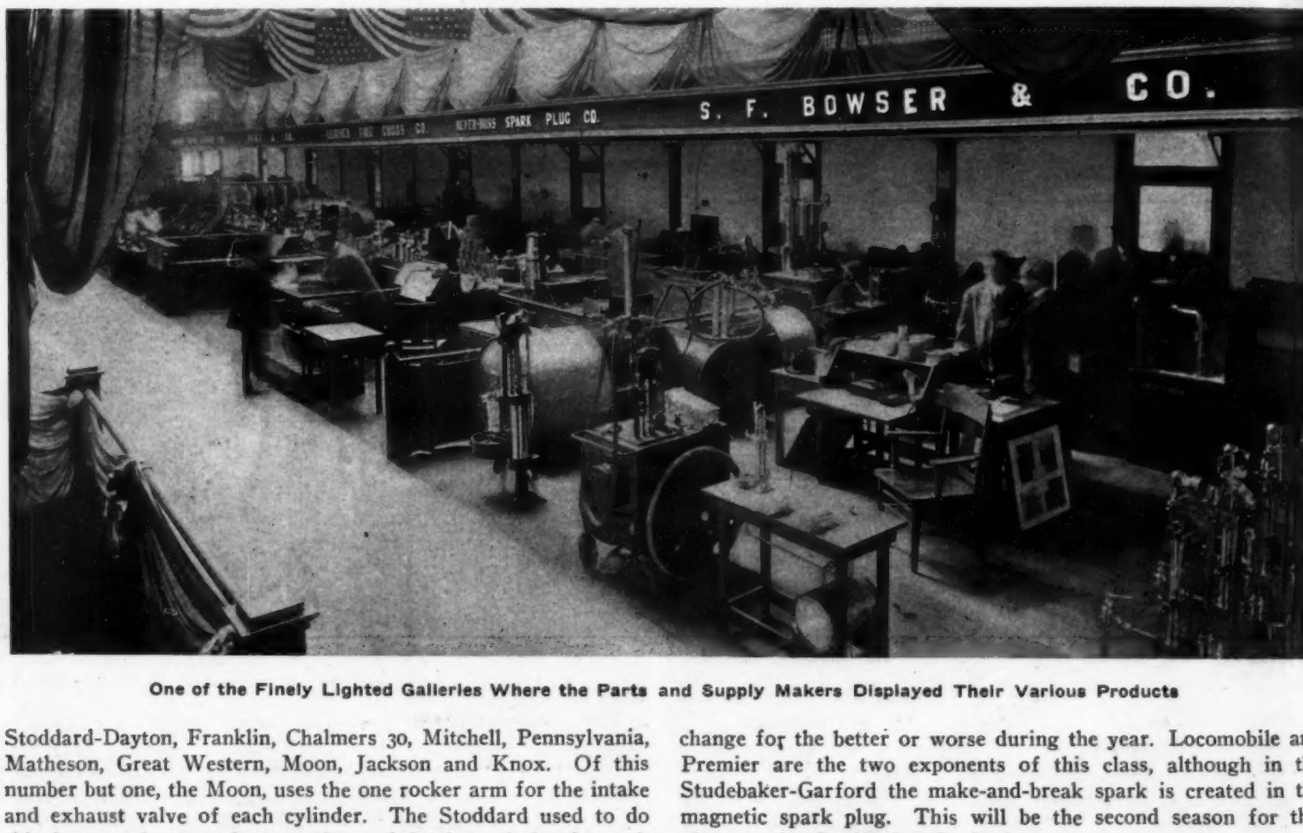
be argued that the six is losing ground, although its progress is very slow. It has some new supporters this year, although a few of its old-time exponents are not exhibiting their sixes. The Mitchell is a new one, so is the Knox, and to these can be added the Standard. Pierce remains in the six-cylinder field only, building nothing else; Winton is in the same boat with two six types; Stevens-Duryea, one of the "six" pioneers, shows two sixes, one being model AA with 4 1-4 by 4 3-4-inch cylinders. Franklin continues its six-cylinder model, as does Oldsmobile, Premier, Matheson, National, and Pennsylvania. All told, there are 24 six-cylinder models on exhibition, representing 13 different factories.

There have been very few additions to the valve-in-the-head army of builders during the past year. The new Standard six is one example, however, and to this might be added the Mora 20. The new four-cylinder Reo with intake valves in the head and exhaust valves in offset ports must not be overlooked. The valve-in-the-head ranks now include such names as Pope-Hartford, water circulation. This new star in the motoring firmament uses a Renault type of hood, and has the radiator located where the dash ordinarily is placed. The two and four-cylinder Maxwell cars all remain firm with thermo-syphoning cooling, as do the Overland, the Jackson and Moline, and one model of Cartercar.

In the field of positive circulation by either a gear or centrifugal pump the latter is claiming more and more attention at the hands of the makers. In some cases this is due to the fact that it is quieter, and in others owing to the lack of gears and the consequent avoiding of gear stripping.

Magnetos Are Universal—The magneto equipment may now be considered practically general, even the $800 car not being complete without it. The dual ignition system is gaining rapidly in popularity, by dual being meant that system with one set of plugs and two current sources, a magneto for general use and a dry or storage battery for starting and emergency purposes. This system is simpler than the complete double outfits.

The ranks of make-and-break ignition have not suffered a



One of the Finely Lighted Galleries Where the Parts and Supply Makers Displayed Their Various Products

Stoddard-Dayton, Franklin, Chalmers 30, Mitchell, Pennsylvania, Matheson, Great Western, Moon, Jackson and Knox. Of this number but one, the Moon, uses the one rocker arm for the intake and exhaust valve of each cylinder. The Stoddard used to do this, but now has a rocker arm for each intake and also for each exhaust. The Moon and Jackson are examples of carrying the camshaft over the cylinder heads, all of the others locating this shaft within the crankcase.

Unit Construction Now a Question—Closely associated with motor design comes the problem of unit construction, by this being meant either locating the motor and gear box together as one, or a similar arrangement of the gearbox and rear axle. Many builders have concluded that it is best to have but two units in the power and transmission systems. The Stevens-Duryea and Maxwell have been originators in this construction, as well as in three-point support. A count shows that there are 58 cars on the stand employing unit construction of either of these types.

Thermo-syphon cooling of the motors has not progressed as many enthusiasts had reason to expect that it would. It is appropriate that at the first National show in the South the father of thermo-syphon cooling should be on hand, namely, Renault. It is also interesting to see shown for practically the first time the Mora 20, which is a low-priced runabout carrying the same general lines as the Renault and using thermo-syphon change for the better or worse during the year. Locomobile and Premier are the two exponents of this class, although in the Studebaker-Garford the make-and-break spark is created in the magnetic spark plug. This will be the second season for this plug on the Studebaker-Garford.

The Franklin is one example of the single ignition system, these motors having the magneto only, and no storage or dry cells for starting purposes. The Ford flywheel magneto is still in use. A few examples of special systems are the Atwater-Kent, fitted on the Elmore and other cars, and the Delco system shown on the Stoddard and Cadillac. The Delco, generally speaking, resembles the master vibrator system in that for a four-cylinder motor there are four non-vibrating coils with a master vibrator electromagnetically operated. On both the Stoddard and Cadillac the coils with vibrator parts are carried on one of the cylinder castings.

Carburetion for next year is much where it was this year. The automatic carbureter is very general. In the Schebler and Stromberg spring-controlled auxiliary air valves perform this function; in the Kingston, Planhard and others, bell valves are used. The water-jacketing of the mixing chamber has come in for general adoption. Many of the cars fix their own makes of carbureters, notable in this class being Pierce, Peerless, Packard, Pope-Hartford, Locomobile, Studebaker-Garford,

Franklin, Stearns, Reo, and others. Pressure feed of gasoline to the carbureter has gained, in a few instances, all of the Stoddard models now carrying the gasoline tank under the rear of the chassis. Nearly all high-priced cars, and many of the cheaper models, have fuel tanks designed to contain a reserve supply of three or five gallons, which can only be drawn upon by turning a special valve.

Circulating Lubrication is Prominent—A review of the new motors would be incomplete without at least passing mention of the lubrication systems. In a word, it is the crankcase contained circulation system which is forging to the front, and now the mechanical oiler mounted on a leg of the crankcase is comparatively rare. The big Stearns has come into line with the circulating system; the Pope-Hartford has installed a combination of this and mechanical system, and so have some others. The oiler on the dash, where it overflowed to the floor boards, is now obsolete. For next year the only indication on the dash of a lubrication system is a bank of two or three sight feeds, and in not a few cases only one. The custom of carrying reserve oil tanks on the chassis is growing. A pump to inject it into the crankcase is used.

Considerable activity has been displayed in the matter of clutches for next season. A notable departure in this line is the introduction of dry disk clutches by the Packard and Stearns companies, the later only in its 30-60 cars. The Stevens-Duryea was the pioneer in the dry disk clutch field, bringing out the multiple disk clutch with leather facing five years ago. The Stevens has continued to use the dry clutch ever since, although the leather has been replaced by thermoid, raybestos, and other wire-asbestos combinations. In the new Packard a comparatively small number of disks is used, and these are faced with wire-asbestos. On the Stearns one set is faced on each side with this material.

The selective gearset has increased in favor during the year. As yet the three-speed set is in the majority, but there is a big array of sets giving four forward variations. In this category are noted Pierce, Peerless, Winton, Locomobile, and some Apperson models. The Maxwell model Q and Hudson are examples of the three-speed selective set entering into the make-up of cars selling at below the $1,000 mark. The planetary is still used on the one and two-cylinder Reos, Ford, Brush, Buick 10's, etc.

There are four or five examples of friction transmission, these including the Lambert, Cartercar, Petrel, Metz, and a part chassis shown by the Acorn Motor Works. The aluminum disk on a continuation of the crankshaft and the fiber-faced wheel on the crosshaft continue to be the conventional friction system.

In final transmission of power to the rear axle the shaft is in the supremacy, There are a few examples of chain, these being the Locomobile 40, some of the Apperson models, Brush runabout, Cartercar, Lambert, Petrel, Metz, and one and two-cylinder Reos. The floating rear axle is also firmly established.

FRENCH CONSTRUCTORS SEE MONEY IN THE AIR

PARIS, Nov. 2—The fact is indisputable that the manufacture of aeroplanes has now become a real industry. Six firms are actively engaged, each one turning out flying machines in regular series. Since he made his flight across the English Channel, Louis Blériot has booked orders for 150 small, one-man aeroplanes and for 12 passenger-carrying machines. By the end of the year he will have sold 200 aeroplanes. At the present moment six completed machines are being turned out per week, and contracts have been booked or are about to be booked which will absorb the output for several months ahead.

Voisin, who has been in the business longer than anybody else, has sold 40 machines during the past year, his total production being about sixty. Henry Farman has sold, or has orders in hand for 40 machines, and Antoinette declares that it has produced or has under construction 60 monoplanes. Bayard-Clément, the well-known automobile constructor, has made arrangements for producing one thousand aeroplanes similar to the one with which Santos-Dumont made his cross-country flights, but equipped with Clément engines. Santos-Dumont will personally supervise the construction. It is not known how many of these machines have been secured by private users and agents, but two hundred will probably be a safe estimate.

The Wright Brothers, who are represented in France by the Société Générale de Navigation Aerienne, do not figure largely on the sales list. As the aeroplane with which Comte de Lambert made his cross-Paris flight is the twelfth of the regular series, the total number given to customers cannot exceed a score. The smallness of the number is not occasioned by lack of orders, but by the initial difficulty in obtaining just the right quality of raw material from America. As this difficulty has now been overcome, construction in large series will commence at once. In view of the flight recently made by Comte de Lambert, it would not be surprising if an important announcement were made shortly regarding the use of Wright machines for military purposes.

French aeroplane builders, like the early automobile manufacturers, have had to make arrangements for training their pupils. Blériot has secured a large stretch of open moorland within three miles of Bordeaux, on which he will establish an aeroplane school before the end of the year. Purchasers of the large machine, selling at $5,200, will be trained free; those securing the small machine at $2,200 can be taught to fly, without being made to pay for smashes, at an inclusive fee of $200.

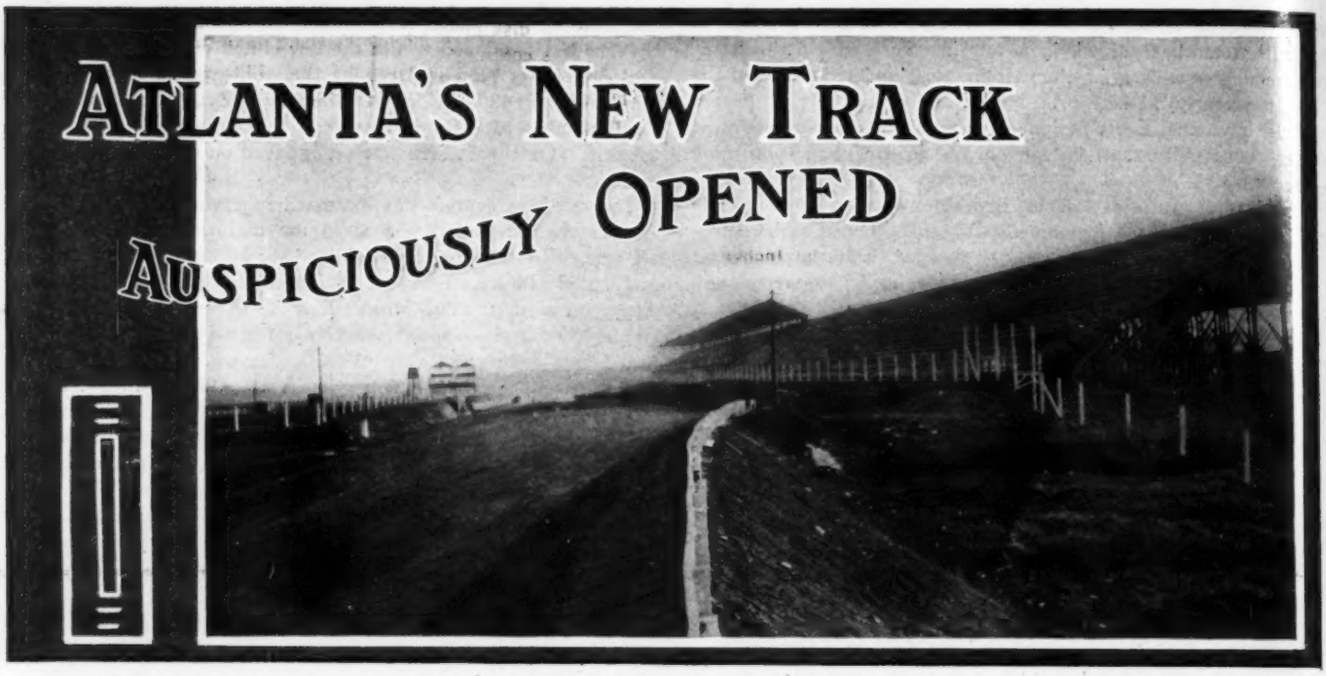
Antoinette, Farman and Voisin have each established aeronautical schools at Mourmelon, near Rheims, the ground being a magnificent plain, with a surface like an English lawn, loaned to them by the army authorities. Sheds have been erected along the edge of the ground, each one being very completely fitted with power-driven tools, comprising everything necessary for repairing the most serious smash. Henry Farman, unlike the others, has erected his main works on the edge of the aerodrome.

The Société Générale at present trains Wright pupils at Port Aviation, the Juvisy aerodrome to the south of Paris. A larger and more suitable ground exists, however, at Pau, and will be used by Comte de Lambert and Paul Tissandier next year. Bayard-Clément appears to have made no arrangements yet for training clients, but as the first series will not be ready until March there is really no hurry.

In addition to aeroplanes, French constructors are convinced that there is money to be made in aeronautical engines. Thus, with very few exceptions, the automobile firms have devoted themselves to the construction of special light-weight engines. It would be much easier to give the names of those that have not produced an aeronautical engine than to state those that have. The list is sufficient to prove that French constructors are convinced that there is money to be made in the air at no very distant date.

Santos-Dumont's Demoiselle—The October 30 issue of *Omnia* contains detailed drawings of Santos-Dumont's small aeroplane, from which the following figures are taken: width, 18 feet 3-4 inch; length, 20 feet; depth of wings, 6 feet 6 3-4 inches; wings cut out in front 7 feet 4 inches across and 11 3-4 inches deep to give room for propeller; wing tips are 4 feet 6 3-8 inches above ground; wings in middle are 3 feet 11 5-8 inches above ground; supporting surface 108 square feet; motor has two cylinders, horizontal opposed, 5 1-2 inch bore by 4.73 inch stroke, weighing 114.4 pounds complete.

ATLANTA'S NEW TRACK AUSPICIOUSLY OPENED



Grand Stand and Homestretch of the Famous Motordrome Which Was Opened Tuesday With 20,000 People In Attendance

ATLANTA, GA., Nov. 9—Speed in abundance, no serious accidents, and an attendance conservatively estimated at 20,000 made the opening meet of the great two-mile speedway at Hapeville an immense success. Although the 200-mile race was the real event of the day, the spectators took the keenest interest in the mile trials and the two-mile open, in which Strang and his recently imported racing Fiat twice outran Oldfield and the Benz once handled by Hémery. Strang drove his 175-horsepower car around the track at a rate that exceeded 95 miles an hour, and he could not conceal his elation at romping away from the older campaigner.

Christie had some of his usual hard luck. Robertson, who was to have appeared in two events with his 60-horsepower Fiat, broke an oil pipe coming to the start, and was out for the day.

It looked like a runaway for Chevrolet in the 200-mile race; after he once took the lead he held it to the finish. Once Dingley's Chalmers-Detroit did the best pursuing, and then Stillman's Marmon moved up. Unfortunately a dip in the track caused the latter to throw a rim and tire on the 166th mile. His car went into the ditch on the backstretch and turned turtle, but neither he nor his mechanic was hurt. Chevrolet completed the double century in 2:46:48, which is a new record for the distance in competition.

Great interest centered in the mile trials which opened the speedfest. Here the honors went to Strang, driving the Fiat which on Brooklands, with Nazzaro at its wheel, unofficially covered a 2 1-2-mile lap at better than 121 miles an hour. Strang made the mile in 37.71, according to the timing machine, which now works out hundredths of a second. This displaces Oldfield's record on the Indianapolis track of 43.6. Strang's speed in miles per hour figures out at 95.5. Next best was the Benz of Oldfield, covering the distance in 40.13, with a skate to the top of the upper turn banking that made the spectators start apprehensively.

Christie's front-drive monster may have been the fastest craft engaged, but it made a slow performance of only 48.82. Its builder and driver, who had been working on it most of the night, said that a pinion gave way. John Rutherford's 30-60 Stearns was the only stock contender, and its mile in 50.85 was good traveling.

Again in the two-mile free-for-all Strang triumphed, his trip being accomplished in 1:31:63, with Oldfield six seconds in the rear. Aitken with a National six outstripped Christie, who had had trouble in getting away, and his team-mate, Kincaid.

In the stock chassis event of the largest class, two Nationals, in charge of Aitken and Kincaid, ran one-two, with an Apperson in the third place. In the smaller stock class Joe Matson appropriated the honors with a Chalmers-Detroit, with another Chalmers the closest kind of a runner-up and Joe Nelson's Buick a near third. The proverbial blanket could almost have been thrown over the three cars at the finish.

The handicappers were too liberal with the two Marmons in the ten-mile handicap. They made a runaway of the first two places, with Aitken's National third, coming from scratch with an actual time of 9:12:41, a new competition record.

The most spectacular event of the day occurred in the 200-mile, when Chevrolet's Buick caught fire on its eighteenth lap. Harding, the Apperson driver, who was in the press stand, was the first to detect the flames, and shouted a warning. Chevrolet did not hear, and completed another mile before the smoke blew into his face. In the brief stop while extinguishing the blaze Dingley regained the lap which he had lost and took the lead. His triumph was short-lived, however, for Chevrolet started again with more speed than ever, and after passing the Chalmers driver was never headed.

The track, as may be judged by the times made, was in good condition, and showed no sign of the haste with which it has been rushed to completion in the last few months.

ONE-MILE TIME TRIALS—FREE-FOR-ALL

Pos.	Car	H.P.	Driver	Time
1	Fiat	120	Louis Strang	37.71
2	Benz	120	Barney Oldfield	40.13
3	Christie	130	Walter Christie	48.82
4	Stearns	30-60	J. M. Rutherford	50.85

TEN-MILE STOCK CHASSIS (451 to 600 Cubic Inches)

1	National	40	John Aitken	8:27.22
2	National	40	Tom Kincaid	8:27.71
3	Apperson	50	Hugh Harding	8:50.65
4	Renault	45	Charles Basle	Did not
5	Stearns	30-60	John Rutherford	finish
6	Fiat	60	Louis Strang	Dropped out

TEN-MILE STOCK CHASSIS (161 to 230 Cubic Inches)

1	Chalmers-Detroit	30	Joe Matson	9:49.46
2	Chalmers-Detroit	30	William Knipper	9:49.84
3	Buick	18	Joe Nelson	9:50.18
4	White	20	James Rodger	Did not
5	Fuller	22	Louis Schroitzer	finish

TEN-MILE FREE-FOR-ALL—HANDICAP

1	Marmon	35	Harry Stillman..(60 Sec.)	8:54.96
2	Marmon	32	Ray Harroun ...(70 Sec.)	9:05.67
3	National	60	John Aitken....(scratch)	9:12.41
4	National	40	Tom Kincaid ...(25 Sec.)	9:18.25

TWO-MILE FREE-FOR-ALL

1	Fiat 120	Louis Strang	1:31.63
2	Benz 120	Barney Oldfield.....	1:37.18
3	National 60	John Aitken	1:43.72
4	Christie 130	Walter Christie	1:51.40

TWO-HUNDRED-MILE STOCK CHASSIS (301 to 450 Cubic Inches)

For Coca-Cola Trophy and $600 to Winner; $300 to Second; $150 to Third

1	Buick	30	Louis Chevrolet.....	2:46:48.47
2	Chalmers-Detroit..	30	Bert Dingley	2:53:33.92
3	Chalmers-Detroit..	30	L. B. Lorimer.....	2:55:15.62
4	Renault	45	Charles Basle.....	3:05:10.31

Note:—Timing of seconds involves hundredths.

Strang the Star on the Second Day

ATLANTA, GA., Nov. 10—Interest to-day centered in the special match race involving Strang, Oldfield and Christie. The big Fiat again defeated the Benz. Strang covered the 10 miles in 7:21.94, which is another competition record, displacing Oldfield's figures of yesterday. Oldfield gradually fell behind as the laps were reeled off, his time being 7:27.71. Even this, however, was better than his record of the day before.

The 10-mile stock chassis brought out George Robertson for the first time during the meet, with his 60-horsepower Fiat, and Strang apeared with its twin brother. Marquis was at the wheel of a 30-60 Stearns and Harding drove an Apperson "Jack Rabbit." Strang led at first, but on the third lap his engine required attention. The other cars quickly passed him, Harding in the lead. Strang finally withdrew, followed by Robertson, and Harding won handily from Marquis by a full minute.

The closest finish of the day took place in the 10-mile amateur free-for-all. John M. Rutherford with a Stearns, William E. Oldknow with a Buick and Calvin Travis with a Chalmers-Detroit were the starters. Rutherford took the lead at the start, closely followed by Oldknow. They set a hot pace, and Travis was soon distanced. Then followed the prettiest race of the meet. Rutherford held the lead until the last lap. Coming down the home stretch Oldknow drew up even with him, and to the spectators it looked like a dead heat. The electrical timing instrument showed that Oldknow was 1-100 of a second, amounting to 17 inches, ahead. For the final event, the four-mile, Strang brought out his big Fiat and again trimmed Christie.

The 100-mile stock chassis race was the hottest kind of a fight between Knipper's Chalmers and Nelson's Buick, until the latter ran out of oil and had to slow down.

TEN-MILE SPECIAL

Pos.	Car	H.P.	Driver	Time
1	Fiat	120	Louis Strang	7:21.94
2	Benz	120	Barney Oldfield	7:27.71
3	Christie	130	Walter Christie	Dropped out

Note:—Strang's time is a new record; average speed per hour 81.46 miles.

TEN-MILE STOCK CHASSIS

1	Apperson	50	Hugh Harding	8:30.68
2	Stearns	60	Louis Marquis	9:30.67
3	Fiat	60	Louis Strang	Dropped out
4	Fiat	60	George Robertson	Dropped out

TEN-MILE FREE-FOR-ALL—AMATEURS

1	Buick	30	William E. Oldknow	8:52.56
2	Stearns	30	John Rutherford	8:52.57
3	Chalmers-Detroit .	30	Calvin Travis	10:02.75

FOUR-MILE FREE-FOR-ALL

1	Fiat	120	Louis Strang	2:47.03
2	Christie	130	Walter Christie	3:10.41

100-MILE STOCK CHASSIS—161-230 IN.

1	Chalmers-Detroit .	30	William Knipper	1:40:46.82
2	Chalmers-Detroit .	30	Joseph Matson	1:41:52
3	Buick	18	Joe Nelson	1:43:10

SUCCESSFUL RADIAL TOURS TO ATLANTA

ATLANTA, GA., Nov. 9—One hundred and sixty-two cars took part in the five good roads tours which centered in Atlanta to-day. The starts of the tour were made from Albany, Fitzgerald, Dublin and Savannah on Monday, and from Augusta on Tuesday. The cars from the first-named three cities spent the night at Macon, and picking up additions to their number, pushed on to-day to their destination. The Savannah tourists made their night stop at Milledgeville, where they, too, gained new recruits.

There was much fast driving in the tour, and the highway was marked by disabled cars at more than one point. No serious accidents were reported, however. The survivors checked in at an early hour. In each run there are prizes to be awarded according to Glidden tour rules, and the technical committee still has much work to do before the winners are decided. The prizes total close to $5,000, so competition is keen.

THE AUTOMOBILE CALENDAR

AMERICAN

Shows, Meetings, Etc.

Dec. 31-Jan. 7....New York City, Grand Central Palace, Tenth International Automobile Show; American Motor Car Manufacturers' Association, with Importers' Automobile Salon and Motor and Accessory Manufacturers. Alfred Reeves, General Manager, 505 Fifth Avenue, New York.

Jan. 8-15.....New York City, Madison Square Garden, Tenth National Show, Association of Licensed Automobile Manufacturers.

Jan. 17-22.....Philadelphia, Second Regiment Armory, Automobile Show. J. H Beck, Secretary, 216 Odd Fellows Building.

Jan. 24-29.....Detroit, Wayne Hotel Gardens, Third Annual Automobile Show, Detroit Auto Dealers' Association. John Gillispie, Manager, Hotel Tuller.

Feb. 5-12.....Chicago, Coliseum, Ninth Annual Automobile Show, National Association of Automobile Manufacturers. S. A. Miles, General Manager.

Feb. 14-19.....Buffalo, N. Y., Broadway Arsenal, Eighth Annual Autuomobile Show, Automobile Club of Buffalo. Dal H. Lewis, Manager, 760 Main Street.

Feb. 19-26.....Newark, N. J., Essex Troop Armory, Automobile Show, New Jersey Exhibition Company.

Feb. 21-26.....Binghamton, N. Y., State Armory, Automobile Show. R. W. Whipple, Secretary.

Feb. 22-26.....Kansas City, Mo., Convention Hall, Fourth Annual Automobile Show.

March 5-12.....Boston, Mechanics' Building, Eighth Annual Automobile Show, Boston Automobile Dealers' Association. Chester I. Campbell, General Manager, 5 Park Square.

March 19-26.....Buffalo, N. Y., Convention Hall, Third Annual Power Boat and Sportsmen's Show. D. H. Lewis, Manager.

FOREIGN

Nov. 12-20.....London, Olympia, Eighth Annual International Automobile Show, Society of Motor Manufacturers and Traders.

AMERICAN

Races, Hill Climbs, Etc.

Nov. 14-17.....San Antonio, Tex., Four-Day Track Meet, San Antonio Automobile Club.

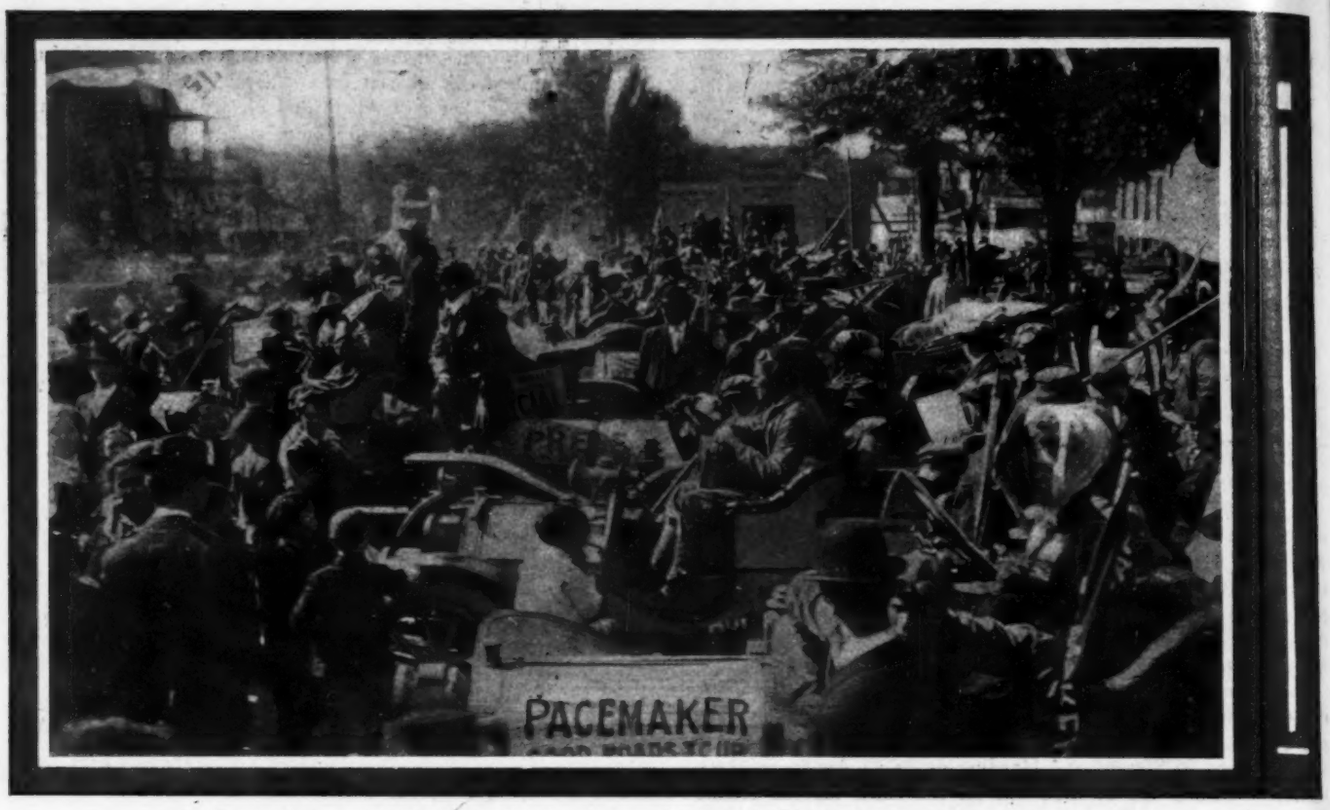
Nov. 19-25.....Redlands, Cal., Hill Climb, Mile High Hill Climb Association.

Nov. 20-21.....New Orleans. Annual Fall Meet, New Orleans Automobile Club. Homer C. George, Secretary.

Nov. 22,.....Denver, Col., Start of "Flag to Flag" Reliability Run. G. A. Wahlgreen, Manager.

Dec. 22-30.....Philadelphia, Fourth Annual Midwinter Endurance Contest, Quaker City Motor Club.

Feb. 4-6.....New Orleans, Annual Mardi Gras Speed Carnival, New Orleans Automobile Club.



When the Tourists Reached Atlanta a Warm Southern Welcome Awaited Them On All Sides

NEW YORK-ATLANTA TOUR COMES TO TRIUMPHANT END

ATLANTA, GA., Nov. 4—After nine days' running the participants in the New York *Herald*-Atlanta *Journal* good roads tour reached the Gate City of the South, triumphantly ending the marking out of a new national highway. Their course has stretched through nine States, covering 1,063 miles, over roads of every degree, good, bad and indifferent.

The tourists in their progress have rubbed elbows with city and country folk alike, bearing to all their gospel of good roads. Through commercial and industrial centers, over mountain trails and across broad tobacco and cotton fields their way has been a demonstration as well of the necessity of highways as of their possibilities when completed.

Of the 28 clean-score contesting cars which left Commerce, Ga., yesterday morning, 26 finished with their records untouched; of the 38 which left Herald Square a week ago last Monday, 35 reached the final haven. Seven had formally withdrawn from the contest for the prizes, owing to penalties that made competition useless, but their continuance with the tour showed the stuff they were made of. Their passengers won the esteem of all fellow-tourists by their goodfellowship and sportsmanlike behavior in the face of breakdowns and hardships.

The Band That Led the Procession Into the Gate City

Two Eleventh-Hour Delinquents—Jacques Futrelle, who had been handling the steering wheel of his Jackson only two months before he left Boston to participate in the tour, was one of the unfortunates. He bent an axle Tuesday, and after repairing it was forced to send the machine full tilt into the ditch at a sharp turn to avoid ramming a team driven by a dreaming negro. The Maxwell, which had withdrawn from Class 4 several days before, pulled the Jackson out, but in the act broke its own differential. After righting his car, many parts of which were bent and disordered, Mr. Futrelle took the Maxwell in tow as far as Anderson, S. C. Then by an all-night drive he succeeded in reaching Commerce at 5:15 yesterday morning in time for the start for Atlanta.

The two cars withdrawn on the last day's run were the White Star, the only representative of Atlanta's automobile building industry, and the Knox, entered and driven by W. A. Kelly, of New York City, which was reported to have broken its steering gear.

List of Perfect Score Cars—The cars which finished the entire run with perfect scores are as follows:

CLASS 1—Cars Costing $4,001 and Over

Thomas, John J. Woodside, Atlanta, Ga.
Thomas, J. L. Barnes, Atlanta, Ga.
Thomas, C. I. Ryan, Atlanta, Ga.
Renault, Renault Selling Agency, New York City.
Matheson, Matheson Automobile Company, New York City.
Benz, Chamber of Commerce, Atlanta, Ga.
Apperson, Official Automobile Blue Book Publishing Company, New York City.

CLASS 2—Cars Costing $3,001 to $4,000

Franklin, W. C. Cleveland, Greenville, S. C.
White Steamer, W. C. White, New York City.

CLASS 3—Cars Costing $2,001 to $3,000

Premier, City of Charlotte, Charlotte, N. C.
Pennsylvania, Pennsylvania Sales Agency, Atlanta, Ga.
Oldsmobile, E. B. Douglas, Miami, Fla.
Corbin, Chamber of Commerce, Roanoke, Va.
Selden, Evelyn Harris, Atlanta, Ga.

CLASS 4—Cars Costing $1,251 to $2,000

White, Board of Trade, Commerce, Ga.
White, Board of Trade, Moultrie, Ga.
White, Chamber of Commerce, Anderson, S. C.
Buick, Chamber of Commerce, Spartansburg, S. C.
Buick, William Oldknow, Atlanta, Ga.
Maxwell, Maxwell-Briscoe Motor Company, Tarrytown, N. Y.
Chalmers-Detroit, Read Holliday, New York City.

CLASS 5—Cars Costing $851 to $1,250

Maxwell, Automobile and Commercial Association, Charlotte, N.C.
Studebaker, W. J. Stoddard, Atlanta, Ga.
Reo, R. M. Owen & Company, New York City.
Regal, E. D. Crane & Company, Atlanta, Ga.

CLASS 6—Cars Costing $850 or Under

Maxwell, Maxwell-Briscoe Company, Tarrytown, N. Y.

Others who finished the run, although under penalty, were the Studebaker, entered by the Board of Trade of Winston-Salem, N. C., which was delayed two days ago by a broken axle, and the Oldsmobile, driven by Henry J. Lamar, Jr., of Macon, Ga., which was penalized on the first day out for delays due to three tire blowouts and a hold-up by a freight train on a grade crossing back in New Jersey.

Story of the Final Day's Run—At Winder, Ga., after a 24-mile run from Commerce, the caravan was held up bodily by the town police force, and compelled to choose between the alternatives of partaking of sandwiches and coffee in the public square or going to the calaboose. Naturally enough, all of the tourists chose the former, although they saw in prospect many other such lunches during the day. Let it not be thought that their detention was on account of breaking the speed limit, for a banner crossing Winder's main street bore the inscription:

"Welcome! Reduce Speed to Sixty-nine Miles per Hour!"

This announcement set the horns to honking and the sirens to screaming, but the invitation was not accepted.

Luncheon at the Club House of the New Motordrome

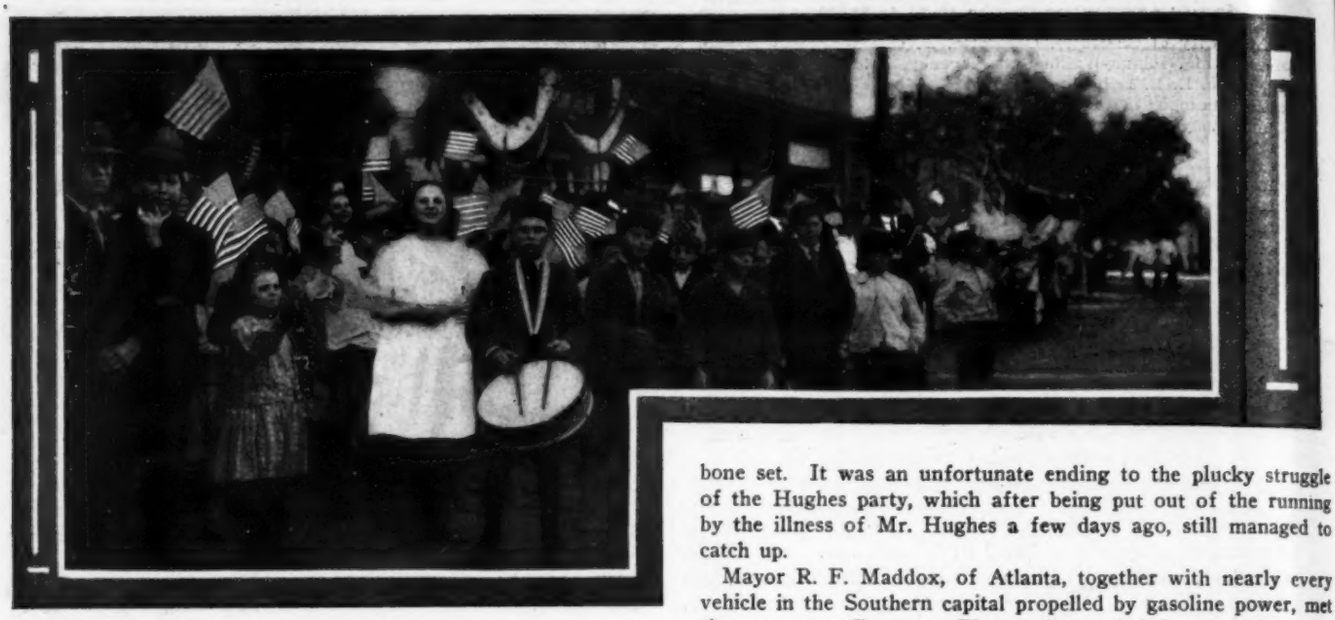
Near the village of Snellville, 55 miles from Commerce, roadside enthusiasts had menageries of 'possums arranged along the roadside, with welcoming banners and more sandwiches.

All along the line the tourists were bombarded with garlands of flowers and fleecy bolls of cotton, until they looked like so many Santa Clauses. And that, too, with cotton selling at 15 cents a pound!

Near Snellville the Benz car, driven by Ernest Stoecker, who had handled its wheel in races, broke a front spring. It took just 25 minutes for Stoecker and Count W. von Gienauth, his passengers to replace the fractured part, and they rejoined the procession before it reached Decatur, 20 miles away. The Stearns official car snapped one of its rear springs, but with the assistance of a village blacksmith mended it by the insertion of a wooden block.

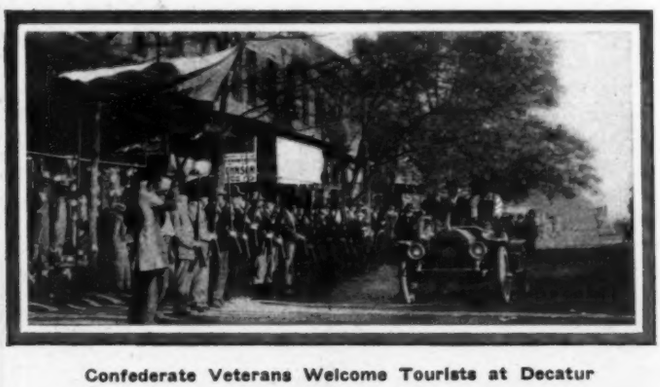
Mrs. F. D. Hughes, of New York City, suffered the only accident which has occurred to any member of the tour. While cranking her Chalmers-Detroit near Stone Mountain the motor back-fired and broke her right forearm. Mrs. Hughes was carried to Decatur, 10 miles away, in the tonneau, and had the

Good Roads Tourists Lined Up On the Broad Expanse of the Homestretch of Atlanta's New Motordrome

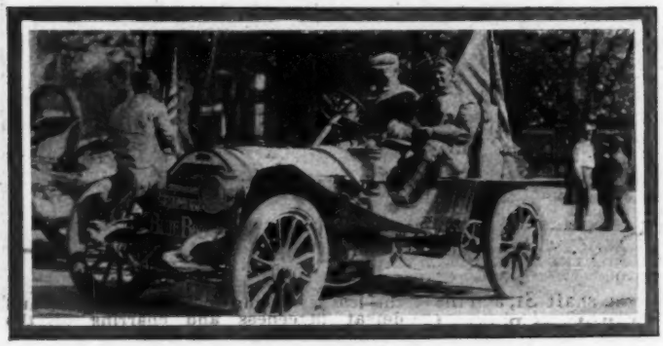


School Children at Commerce, Ga., Greet the Cavalcade

There Was Practically No Speed Limit in This City



Confederate Veterans Welcome Tourists at Decatur



"Official Blue Book" Car a Clean Score Survivor

bone set. It was an unfortunate ending to the plucky struggle of the Hughes party, which after being put out of the running by the illness of Mr. Hughes a few days ago, still managed to catch up.

Mayor R. F. Maddox, of Atlanta, together with nearly every vehicle in the Southern capital propelled by gasoline power, met the caravan at Decatur. The tourists and their escort formed a procession about five miles long, and swept into the city like a Roman triumph. A hundred thousand persons lined the streets in the business district, overflowing the sidewalks and leaving only a narrow lane, through which the dust-coated tourists passed at a snail's pace. Finally the column was headed for the Piedmont Driving Club, where luncheon was served on the terraces flanking the clubhouse. When the parties returned to their hotels the New York-Atlanta tour had passed into history.

PRIZES FOR 26 WINNERS IN TOUR

ATLANTA, GA., Nov. 5—The awards of trophies for the Good Roads Tour over the new national highway from New York to Atlanta were finally decided at a meeting of the judges held this morning in the Piedmont Hotel. Twenty-six cups were awarded to those who finished with perfect scores. The prize fund amounted to $1,700, and was divided as follows:

Class 1—Seven perfect scores; $301 to the class, $43 to each perfect score.

Class 2—Two perfect scores; $300 to the class, $150 to each perfect score.

Class 3—Five perfect scores; $300 to the class, $60 to each perfect score.

Class 4—Seven perfect scores; $301 to the class, $43 to each perfect score.

Class 5—Four perfect scores; $300 to the class, $75 to each perfect score.

Class 6—One perfect score, $198.

The fortunate ones were those enumerated above as having finished with perfect scores, for Referee Scarritt did not inflict any of the conditional penalties which he has held over the heads of a few drivers whose conduct was not always as considerate as it might have been. The awards, ranging from $43 to $198, in the case of the little $850 Maxwell, will be made in the form of souvenir cups or trophies.

The festivities reached their climax in the banquet to the good roads pilgrims given last night by the Atlanta Reception Committee in the ballroom of the Capital City Club. Two loving cups were presented by the city of Atlanta to the two newspapers which promoted the run, the New York *Herald* and the Atlanta *Journal*. Mayor Robert E. Maddox presented the cup to the Southern member of the newspaper alliance, and it was accepted by James R. Gray, editor and manager of the paper. Ex-Governor Hoke Smith presented the *Herald* cup, which was accepted in behalf of the paper by Hamilton Peltz. Toasts were drunk by all, amid the cheers of the guests, while the band played "Dixie" and the "Star-Spangled Banner."

PRECISION IN PARTS PRODUCTION

By Thos. J. Fay

ELKHART, IND., Nov. 8—History, as it relates to the building of automobiles, holds in its maw many half-baked attempts, some flat failures, and much of success. When a car indicates that it is not going to make good history, and it happens to have a few parts (from some outside shop) in its make-up, the parts are condemned as beeing the faulty members, and parts makers are ladened with the odium.

Perhaps the maker of the parts followed directions, made them agreeably to the drawings and of the materials indicated in the various clauses of the automobile maker's specifications. If so, who is to blame? Certainly, the designer should take all the responsibility of failure if the parts made and furnished are as per drawing and up to the requirements as respects materials. There is still another phase of the problem, entirely besides the story of who should shoulder the odium when failure is the reward of lack of quality of material or due to a surfeit of poor designing. If, when parts makers are requested to bid on work, they find that it is a cheap and incompetent product that is wanted, and the skill of the same parts makers is interjected so that the work is moved up to a higher plane, it is assured that the end will be far more satisfactory and the business will grow and prosper. It may take a little tact to successfully interject a discussion of quality, especially when the work is to be done for inexperienced, but ambitious (possibly), makers of automobiles, who may think that anything is good enough to serve the purpose. If tact fails, and it will betimes, is it not then time to respectfully decline to participate in what is sure to be a flat failure?

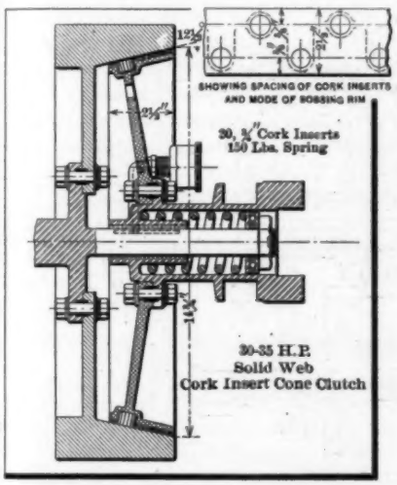

SHOWING SPACING OF CORK INSERTS AND MODE OF BOSSING RIM
30, ¾" Cork Inserts
150 Lbs. Spring
30-35 H.P.
Solid Web
Cork Insert Cone Clutch

Fig. 1—Cork insert clutch with leather facing, aluminum drum and ball thrust bearing behind spring

Wise Parts Makers Decline to Make Poor Units—The makers of parts are fast learning the futility of doing inferior work, and many of them flatly decline to deviate from what they have learned by sad experience to be a safe course. It is all very well for some company to say (in advertising): "We are building 1,000,000 automobiles of the $5,000 class to sell at $300." If it can be done, the sooner some clever concern accomplishes the task the better for the ultimate consumer. If it cannot be done, then the question is, will it pay parts makers to reduce quality below the point of safety to help "put over" a projeect which is deceptive?

The class of parts makers who expect to survive say no, absolutely no!

In all fairness, it is difficult to discover any experienced concern at the present time which will lend itself to any such undertaking, and it is now the settled policy of the parts makers of acumen to keep well away from the class of work the nature of which will not survive a critical inspection and a road test.

Concrete Illustrations Will Tell the Story Best—Let us sojourn into a shop, examine the product, and learn in so far as experience and a close examination will serve the end, what is a reasonable expectation; for the purpose the product of the General Manufacturing Company, at Elkhart, Ind., will be illustrated and deescribed. This concern makes transmissions, clutches, and such other parts as would seem to be in strong demand, having for customers companies who assemble cars.

Cone Clutches Are in Brisk Demand—Despite the wide variety of multiple disc and other forms of clutches which found favor in automobile designing in recent times, there is still a vast liking for the more simple form of cone clutch, especially in view of the utility of cork, in "insert" form, in conjunction with leather, for the facing. Fig. 3 is of this type of clutch as produced by the General Manufacturing Company, under license from the National Brake and Clutch Company. This clutch is rated at 50 horsepower, and the line comprises sizes from 20 horsepower up. It is claimed for this type of clutch that it will not slip, even if oiled, and will not act "fierce" in starting. Then, it is of great advantage to know that the leather facing will not heat and char, which the cork prevents.

In the absence of the cork inserts it is necessary to place springs behind the leather facing, which is done in the manner as shown in Fig. 4, there being six of these springs evenly disposed around the periphery of the clutch. Among the mechanical features of note, the double universal joint J J, with a slip-member, S, between, offers a means of eliminating the ills of road inequalities to a marked degree. The clutch spring Sl is under and concentric with a shell, and the pressure is sustained by a thrust ball bearing, B.

The spider is of aluminum of a suitable grade, taking into account the character of the work, which included centrifugal forces as well as thrusts, compression and angular distortions. In machining, it is appreciated that the clutching members must engage with precision, and care is exercised to have them meet fair, hold to concentric relations and assemble to a nicety.

Mechanical Differences Are Manifold—Without attempting to depict within the confined limits of this article even a small measure of the deviations in mechanical details which attend the designing of clutches, it may be advantageous to show something of the possibilities. Fig. 5, for illustration, represents an important difference, since the pressure on the spring S may be increased or reduced by screwing up on the cap screw C, which is threaded into the shank of the shaft S1, and the ball thrust B served

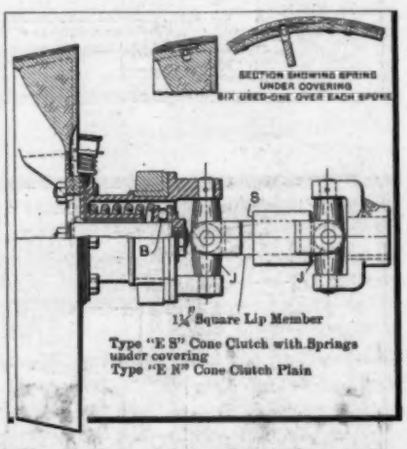


Fig. 2—Cone clutch using springs under the leather facing to assure contact, and defeat fierceness and charring of the leather

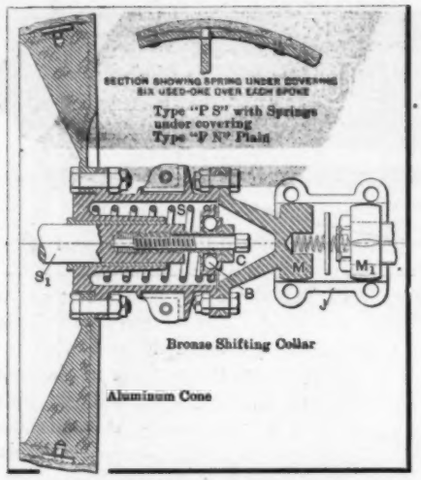

SECTION SHOWING SPRING UNDER COVERING SIX USED-ONE OVER EACH SPOKE
Type "P S" with Springs under covering
Type "P N" Plain
Bronze Shifting Collar
Aluminum Cone

Fig. 3—Leather-faced clutch with means for adjusting the pressure of the spring at will

to sustain the reactive pressure.

The universal joint J, back of the clutch, consists of a housing with a broached (square) hole, and the male members, M and M1, engaging. The spring S2 serves to keep the members M and M1 separated, and in assembling the power plant into the chassis the joint, so made, offers sufficient end-play to enable the units to be lifted out.

The clutch as shown, including all its detail, represents stability, and the cost of the finished product is well within range, even considering cars which sport a modest price tag. What the situation portrays is that it is not necessary to reduce quality below a certain deserving level, and a little ingenuity, properly enlarged upon will generally suffice for the purpose.

As an illustration of the class of work done, referring specifically to transmission gears, reference may be had to Fig. 1, of the Model M system, giving three speeds and reverse, selective. Attention is directed to the short, large diameter main and lay shafts, rolling on Hess-Bright ball bearings of the annular type, in housings of bronze, with closures, thus eliminating the silt of the road and rendering lubrication as a normal expectation.

In this transmission the high speed is "direct," and a roller bearing, R, is placed at the telescope joint of the main shaft and its extension. In going into direct on the high gear, engagement of a pinion, P, with an internal gear. It has the virtue of rendering the shift easy and noiseless, while the work falls on many teeth, instead of (in some examples) four jaws. The extension shaft rolls on two sets of ball bearings, B B, so far apart that displacement is quite out of the question, and the universal joints, when they are to be adjusted into place, may be forced up on the taper ends of the shaft at T and the extension at T1.

The mountings of the bearings, while they are anything but costly, conform to accepted practice, in that the inner race is

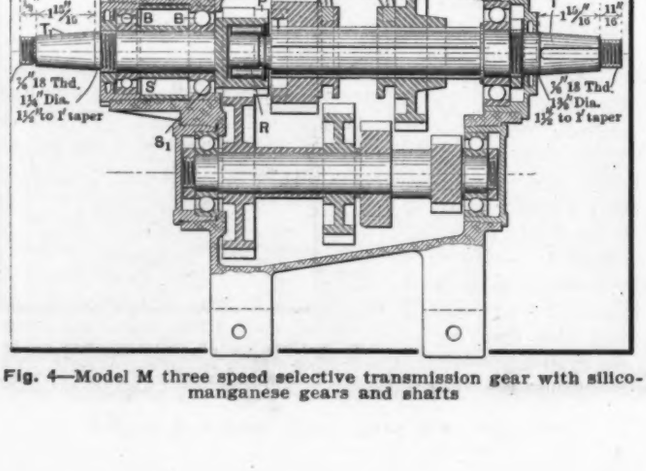


Fig. 4—Model M three speed selective transmission gear with silico-manganese gears and shafts

locked and the outer race is free to slide in the axial plane, being a "sucking fit," however. As an example of this, refer to the two bearings on the extension shaft, and observe that a sleeve, S, serves as a spacer between them, and pressure induced by a threaded member, N, is assured, due to reaction of the shoulder S1.

The selective means is so contrived as to manipulate the racks R2 and R3, and they, being of good diameter, sliding in liberally proportoned phosphor bronze bearings, stand up to the work, sliding freely because they do not deform. The case is of aluminum of suitable thickness, noise considered, and is machined so accurately that it is grease-tight, while ribs are placed at points service, pinch the bearings, and render the case leaky. Careful design makes highly practical the use of this material.

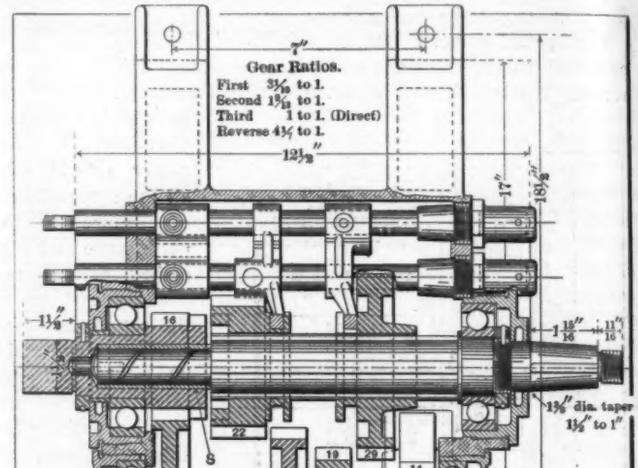


Fig. 5—A modification of the Model M idea, differing in details, among which is the telescope joint bearing

In this type of gear the ratios of reductions of speeds are as follows:

Direct on high	1 : 1
Hill climbing	1 9-13 : 1
Low	3 1-10 : 1
Reverse	4 1-7 : 1

When Cost Must Be Reduced—With a view to showing how cost can be reduced without eliminating quality, Fig. 2 is offered, and in this example the materials used are the same in every particular, excepting that the roller bearing at the telescope joint is displaced and a bronze sleeve, S, is substituted. The sleeve is long, made of a fine grade of bearing bronze, and is properly fitted into place. This telescope joint is used on many cars of proven quality, and some makers prefer it to ball or roller bearings for this duty. It is less expensive to make, works very well indeed, and in the absence of any diminution in quality of material or workmanship, a difference of opinion is legitimate.

In this example the gear ratios are the same as in Fig. 1, and experience has shown that it is a good disposition of this important phase of the problem. The gears in this, as well as in the example Fig. 1, are of heat-treated silico-manganese steel, and, besides great hardness, kinetic ability is a marked quality. It has been proven, time after time, that teeth of gears made of

this material, if they are properly hardened, are not only "file hard," but they may be deformed by exerting great pressure in a testing machine without showing signs of fracture. The "test" fracture is that of a fine grade of material, of great reliability under shock conditions, and shafts of the same material seem to complete the undertaking from a quality point of view.

In the plant of the General Manufacturing Company, pyrometers, annealing equipment, methods of cementing and means for quenching are available, and uniformity is one of the necessities that the company recognizes. In the process of manufacture, hobbing machines, gear-cutters and other equipment of the latest and most available form are used, and additions are being made as rapidly as the situation would seem to warrant. Testing equipment and methods of inspection are all that good practice demands, it having been found that when the work is well executed, filing and fitting are eliminated and cost is reduced in proportion, so that costly machines which induce interchangeability soon pay for the excess initial cost.

CAUSE OF EXPLOSIONS IN GAS GENERATORS

By CHAS. B. HAYWARD

ACETYLENE gas generators, to give the service which may normally be expected from them, must constantly be maintained in good condition. Private owners, as well as professional drivers, have a habit of permitting the generator to go unattended for several days after it has been used. Then, when the generator is opened, it is found to be more or less obstructed with the residue of carbide that has become caked to the copper, and is accordingly difficult to remove. The first thought of the average man is to take the nearest piece of metal, a file, or a scraper, and set to work to remove the deposit. It is not generally realized that such a proceeding may lead to a serious accident.

The residuum left by the carbide after the generation of acetylene gas attacks the copper of the receiver and chemically combines with it, forming a new substance known as acetylid of copper. This is a highly explosive product, which does not require much excitation to set it in action. Several instances are known where simply bending the copper tubing employed to conduct the acetylene gas from the generator to the lamps gave rise to a series of explosions of a startling nature. The whole interior of the tubing was coated with a light, hard film of copper acetylid, and a report was heard every time the tubing was bent.

In the case of a generator, striking the deposits with a tool or piece of metal of any kind is apt to explode this deposit, particularly as the residue frequently contains silicious impurities that are hard, and will either spark or generate considerable heat when struck. The violence of the explosion will naturally vary; the worst penalty of carelessness will probably be burnt hands or face. The best protection against this danger is naturally to clean the generator at a sufficiently short interval after using to avoid the hardening of the deposit on the copper surface; but when this has already taken place the cleaning should either be done with a metal tool under water or a piece of wood.

VENTURI TESTS SHOW WIDE VARIANCE

So many carbureter makers and experimenters have taken up with the Venturi tube shape for the vaporization chamber, that it will undoubtedly make many sit up and take notice when it is stated that the Venturi tube, *per se*, does not show constancy, its efficiency for hot water measurements (its original use was measuring purposes solely) differing widely with its efficiency on cold water. More than that, the efficiency is a variable quantity, differing for various degrees of heat.

Thus, in a series of tests made at Worcester Polytechnic Institute, and presented in a paper to be given at the annual meeting of the A. S. M. E. in December, this point is brought out very prominently. In the tests, the following test temperatures were used, and from the results obtained at those temperatures a curve of efficiencies was plotted which includes all temperatures possible with water as a medium: 80 deg., 120 deg., 140 deg., and 180 deg.

These figures were approximately .942, .949, .952, and .959, respectively. Although actually the efficiency of the Venturi tube at those temperatures, the writer of the paper in question, Prof. C. M. Allen, designated these quantities as Venturi coefficient. Plotting these, a curve was obtained which was a straight line starting from .927 efficiency at zero degrees and running to .962 at 200 deg.

FRENCH LEADER TURNS TO STEEL

The discussion of some years ago as to the suitability of steel for automobile engine pistons will doubtless be renewed with the announcement that the French leader in small-car construction, Sizaire-Naudin, has adopted this material for all pistons. This use in small cars of modest price is epochal, for if there is any place where reliability is desirable, it surely is in the small car. This piston, too, carries but two rings, and has the piston pin fixed by means of a taper wedge driven into the split end of the pin itself. The top of the piston is made concave to secure better combustion effects.

NEW ALUMINUM SOLDER CONTAINS TIN

It is stated in a French contemporary that the best soldering medium for aluminum is an alloy of that metal and tin. The proportions vary according to the extent to which the soldered articles are intended to be worked; 45 parts of tin and 15 of aluminum forming a good solder for such as are to be shaped afterward. A harder solder, but less easily applied with the soldering iron, is prepared by melting 4½ parts of red copper, to which are then added 3½ parts of zinc and 4½ of tin, the heating being continued until a homogeneous alloy is obtained.

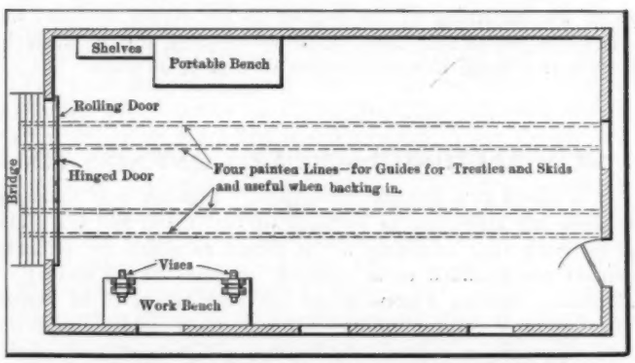
In *The Metal Industry* it is stated that the surface of all aluminum is covered with a thin, invisible coating of aluminum oxide, and that this coating forms instantly after the surface is cleaned; it is very refractory, and is soluble only in hydrofluoric acid. It is necessary, therefore, to remove this coating of oxide simultaneously with the soldering operation, and this is best accomplished mechanically by abrading the surface with a steel or brass scratch brush while the solder on the surface is still molten.

FEATURES OF NEW WIRE WHEELS

For the season of 1910, the well-known English firm of wire-wheel builders, Rudge-Whitworth, will produce more wire wheels than ever before, these having gained much in popularity in the past year, both through excellent service in touring use, and more through the stand-up qualities displayed in the races, which have been held. The latest wheels will have a triple row of spokes, the third being set on a long diagonal out to the extreme outer end, so as to lend additional strength to resist the severe side strains. Not that the previous wheels, which will still be continued, lacked in this particular, but that the public doubts on this score, and must be reassured. So wide spread has been this demand, that the makers are now forced to make no less than nine different models, to fit the various car designs, and differing bearings used. The new triple spoke lends itself well to more advanced steering-gear design.

Two Examples of Stone Construction, One, Rubble Stone Laid in Concrete, the Other, Field Stone Laid as Broken Ashlar

NOT once, but several times, has the matter of individuality been commented upon in the course of this story. An example will be given to show to what an extent this enters into the final form of the motor house. The house to be described was built by a man who was something of a mechanic, in that he worked on his car early and late, not because it was necessary, but from preference.



Floor Plan of Garage Possessing an Unusual Pit Idea

This mechanical inclination caused him to plan and build his garage with that idea very prominently in view. So that, although, as described, it sounds like a very funny arrangement, it nevertheless is a very handy one for this particular man. The garage, as shown in the floor plant, is rather large for a single car; in fact, it is plenty large enough to house four cars without crowding. The shape is rectangular, with the door at one end. This is a double door, with a third additional hinged part.

The other end carries a small door for personal use, this being near the house. Besides this, there is a large window. The two sides each carry three good-sized windows, so that the interior is well supplied with light. Near the front end, where most of the work is done, there are: a large work bench, carrying two vises; a portable bench, which may be used to hold parts when taking the car apart and a set of shelves. These are conveniently placed on the two slides, so as to make the most of the available space, the stationary bench and vises being on the left.

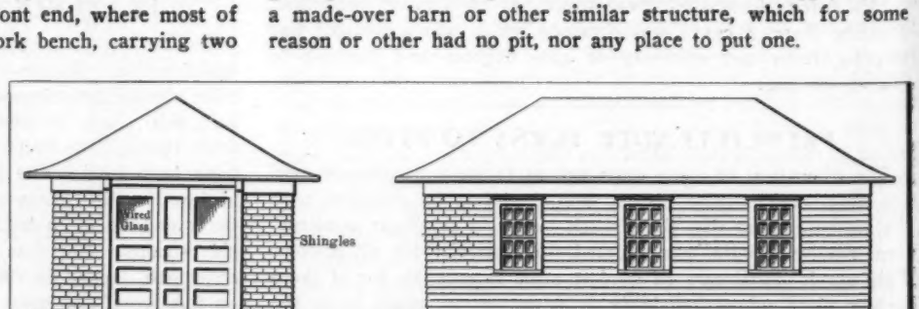
By far the funniest part of it, in matter of fact, the only out-of-the-way part is that of the pit arrangement. The house as built did not have a cement floor, but being located some distance from a city, a pit was an absolute necessity, the latter being realized more particularly after the house had been built. So, a pair of comparatively small and light horses were built, or more correctly, a pair of trestles. These were 31 inches high and built strongly enough to support a car, the length being just sufficient to care for the whole length of the car.

Some Details of Automobile Trestle—Of course this was flat on top so that the car would stand on it of itself. So some method of getting the car up onto the top was necessary. For this purpose another short, inclined pair of trestles were built. Then to get the car onto the "pit," the two sets of flat topped trestles were dragged out into the center of the floor. Next the two inclined members were set into place in the front, and the car could be driven up onto it.

In this position, it was just high enough to allow one to work under it, but since this meant much stooping and looking upward, one of which was hard on the back and the other tiresome to the eyes and neck, the owner built a sort of reclining chair. This he used as a seat, pulling it under the part of the car upon which he wanted to do some work, or removing it when there was no necessity for it. The back of this was adjustable for any inclination, which was very handy at times, and being simple, could be altered very quickly, to suit the needs of the occasion. It is shown in detail on the next page.

When there was no work to be done upon the car the four trestles and the seat were set aside in a corner or elsewhere, the size of the house allowing lots of room for it. In this way the whole floor was kept solid, without any holes to be avoided and counted upon at all times. In addition, it left the whole floor for maneuvering space, and cost very little. Being practically indestructible, the whole outfit could be carried outside if at any time it was desirable or advisable to use the whole interior for cars, as in the case of several visiting cars.

Thus a single instance suffices to show that the man of ingenuity is never stumped. This method would be applicable to a made-over barn or other similar structure, which for some reason or other had no pit, nor any place to put one.

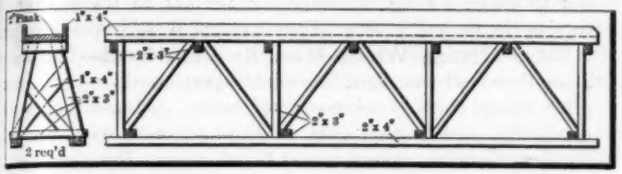


End and Side Elevations of the Same Garage, a Home-Built Affair

In an earlier number of this story the various divisions of the materials of construction were given as:

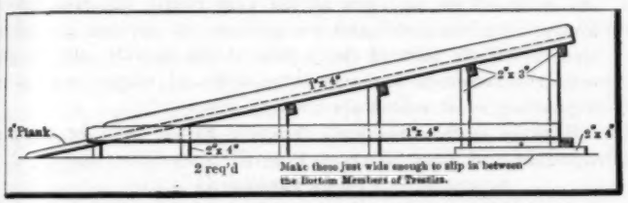
1. Wood.
2. Wood and steel in combination.
3. Steel alone.
4. Concrete.
5. Hollow tile.
6. Other forms of fireproof construction.
7. Concrete in combination with any or all of the others.
8. Brick or stone.

Of these the first has been rather well covered thus far, with the possible exception of the portable garage. This may assume many forms, but the more usual one is that shown in two views at the conclusion of the last chapter, namely, an all-wood structure built either on the panel system, or "knocked down."



Trestle with Flat Top Which Served as a Pit

The more usual is the latter, although the former has much to commend it, being just as cheap to the manufacturers and of much easier erection to the buyer, who usually is a man of very little skill, at least in that particular line.

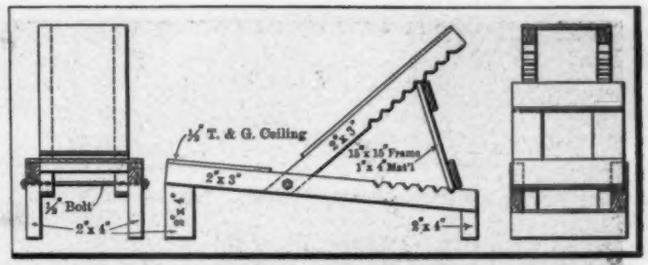


Sloping Trestle Used to Get the Car Up Off Floor

Features of the Portable Form—Elsewhere on this page will be found several views of one of the portable garages now on the market. The plan shows that it is about 13 feet wide by 19 feet long inside. Of this, however, not all is available, some room being taken up by a large workbench, a cupboard and other conveniences. These cut the available floor space to about 12 feet by 16 feet, which is very close to the size arrived at in the previous consideration of the least size that would accommodate a single car with any kind of comfort.

There is a double door at the front, measuring 8 feet in width by 8 feet 6 inches in height. The latter is made large to allow of the car entering with the top up, as it is a very disagreeable feature to have to get out in the rain to fold the top back in order to be able to drive the car in. In addition, there is a small narrow side door for the owner's personal use.

Two windows on each side, with two smaller ones at the back furnish plenty of light, the back windows being grouped over the work bench. The foundation is more in the nature of a suggestion than a necessity. This is not furnished by the makers of the garage, the plan being given to enable the prospective buyer to provide a concrete or stone foundation if he so desires. The locust posts, indicated by the round black spots, are furnished, these being 3 feet 6 inches long. Four of these are in front, and are for the support of the inclined platform or runway to be built there. The other four located in the middle are real foundation posts, in addition to which there are two more to form a foundation for a platform leading to the side door, these not being shown.

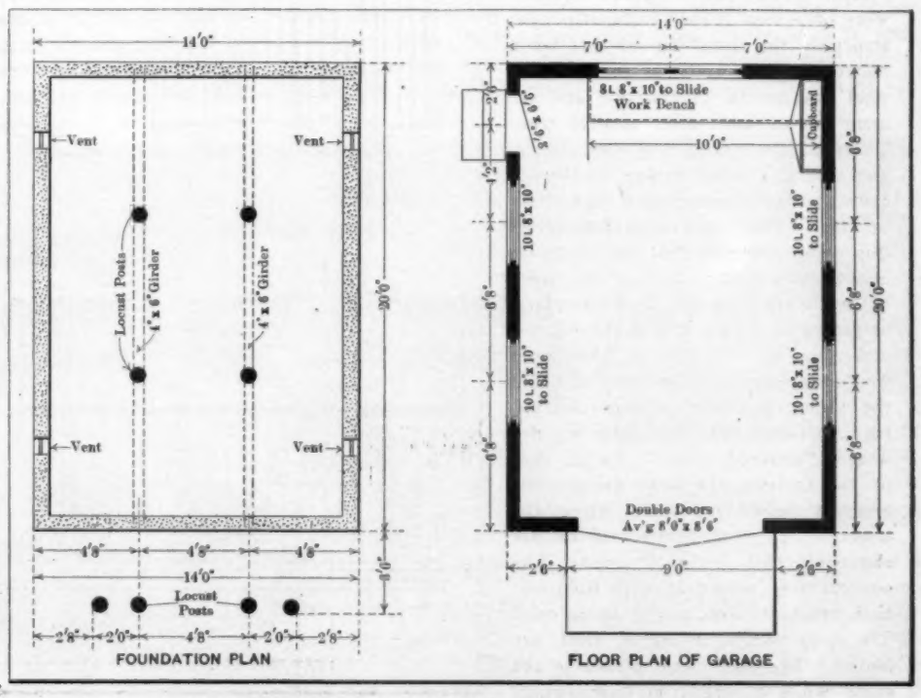


Home-Made Morris Chair to Eliminate Backaches

When foundations are laid a single width of brick, that is 8 inches, is recommended, or this same width in cement or concrete. A description of some of the other features may be of sufficient interest to warrant the space, so will be given.

Portable Building Details—The structure is designed with two lines of girders, giving a double support directly under the car. All exposed framing material is dressed lumber, while the walls and roof framing are well braced. The roof is sheeted over with a sheating of surfaced boards laid tight. Over this shingles are laid, making a simple but good roof sure to be waterproof. Slate, tin, steel, or any roof composition may be had if desired, but not being regular, cost more. The cost of this house, as shown in the two plans, elevations, and exterior and interior views of last week, is roughly between $175 and $185 at the manufacturer's factory. This with the freight and charges for erection bring the whole cost up to about $225, which makes a very serviceable garage at low cost.

Another illustration shows a frame garage in process of construction. This as may readily be seen is just large enough for one car, has a single door at the front, this being of the double hinged type. Then there are two windows on each side and one at the rear end. The door size is 8 feet wide by 8 feet 6 inches high. The actual inside space in the clear is 12 feet by 17 feet 6 inches.



Floor and Foundation Plans of Small One-Car Wooden Portable Garage

One-Car Frame Garage in Process of Construction

It was built on contract, just as shown, on the outskirts of Yonkers, just beyond the city line of New York, by a carpenter for $350 finished. Considering the geographic location the contract price seems very modest.

Besides the features just described, the floor is of Southern yellow pine, while the roof, contrary to the usual custom, is covered with steel. The picture would seem to show that this was shingled, but that is the shape in which the steel came, that is, in imitation of shingles.

An inspection will show that the owner missed an excellent opportunity to have a first-class pit made very cheaply, as the condition of the ground upon which it is built (the side and top of a hill) make a natural pit. That is, by making a middle section of the floor hinged or loose and laying a second floor on the surface of the ground, a pit would be complete. To use this it would only be necessary to lift up the floor boards then walk around outside and down the hill, laying down on the false floor there, or if the character of the work permitted it, standing up there.

Not Very Much Steel Used—Very little steel is used for garage construction, the usual use of this being restricted to the roofs as above, to the steel framework of concrete and cement places and other similar uses. There is, however, a firm now making and selling a small garage of the so-called portable type, which is entirely of steel. The meritorious feature of this construction is that the structure may be very close to the car size, since the walls are very thin, and secondary, or rather primarily, it is fireproof.

As far as erection is concerned the house comes to the buyer in about the same condition as does the all-frame building, that is, partly but not wholly "knocked down." In the case of the former—the steel garage—the erection needs no tools, since the wrenches from the car's tool kit are about all that could be used. The corners are formed of very light-section structural iron, angles being used. To these walls of sheet iron are bolted. The roof construction is the same, while a sheet-iron door swings from an angle iron frame work. The roof "boards" are also sheet iron. With a concrete floor, which every garage should have anywhere, this building erected is as near fireproof as it is possible to make it.

Since small angles are not expensive, and sheet iron is cheap this form has many things to commend about it. With an exterior gasoline tank—the only proper form—the whole outfit would be so secure from the possible inroads of fire that the owner of one of these would be foolish to carry any insurance, at least he would if he kept the car in his own garage.

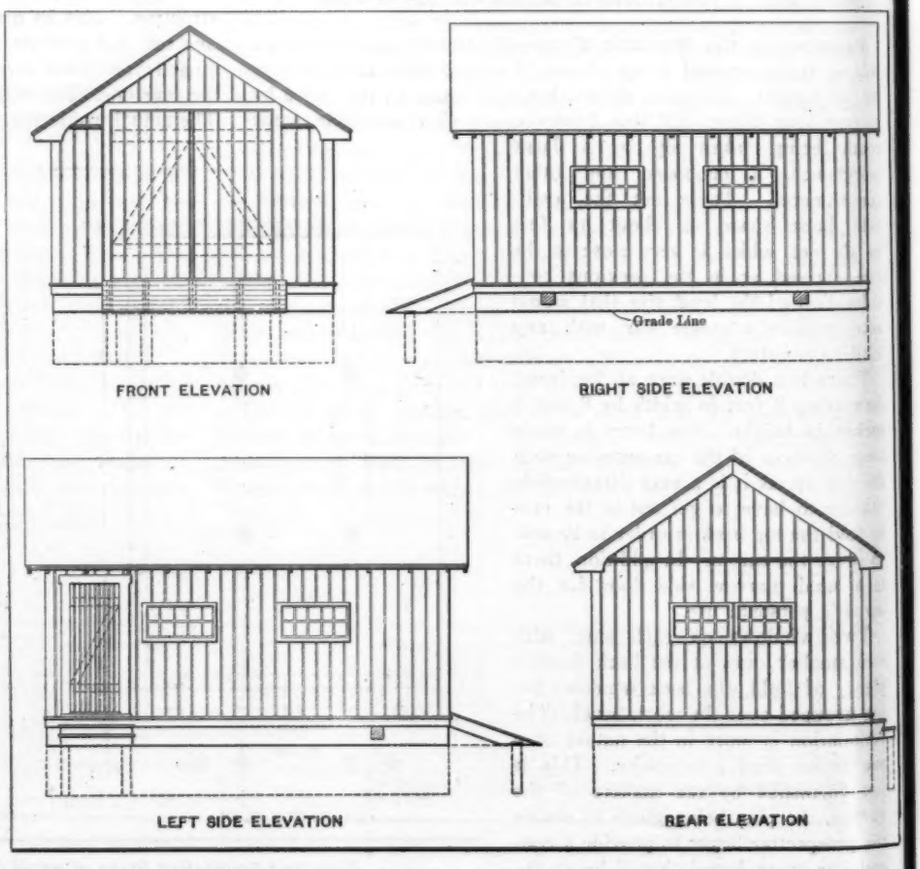
In the all-concrete garage much steel is used, first for the added strength which it gives and second for wearing parts. The latter may at times be adapted to other forms of construction than concrete and should be used wherever possible. Thus for door sills, particularly the main door through which the car or cars enter, this is very good. In this position it may set down low so as not to make a ridge or bump for the car to travel over when coming in or going out. Thus located it will wear for years.

Other Things Which Must Be Considered—The material alone is not all that must have intelligent consideration. Among other things there is the matter of paint. A frame house with a good filler and a good coat of paint to start with, as well as another every two years would be all right. But this treatment would not do at all for the steel house, or even for the steel roof to the frame garage. Steel by exposure to the mosture in the atmosphere oxidizes or rots away and to prevent this it must be well covered with paint of weather-resisting qualities.

Not only must it be well covered in the first instance, but it must be kept covered at all times, for while the garage might not work all the day, nor all the year round, the atmosphere is always "on the job" and to prevent its serious inroads the steel should be painted every year at the outside, and in places near the seashore or some large body of water twice a year if possible, or if within the owner's means.

Next in order the small concrete garage will be taken up, discussed and many of the best small types illustrated.

(To be continued)



Four Elevations of Portable Garage Shown on Preceding Page, and Illustrated Last Week

NEW ENGLISH IDEAS IN AUTOMOBILE CONSTRUCTION

WHILE no patriotic American likes to concede that there is anything in the oft-repeated remark "they do things better over there," meaning on the other side of the ocean, it is a fact, nevertheless, that more new devices are brought out and given an intelligent trial on the other side than in our own country, considered very progressive.

As bearing directly upon this subject and perhaps proving or disproving the same contention, a number of recent new ideas in automobile and kindred construction will be shown and discussed. Some of these possess the merit of much trial and experimentation, while others have not yet suffered a severe test, and are more in the nature of untried inventions, which appear to possess more than average merit. The parts to be discussed are mostly engines, but a few new carbureter ideas are included. All of the devices to be described are of English origin.

Novel Expanding Carbureter—The first to be described is a carbureter called by its inventor, Alexander G. Ionides, the Polyrhoe Expanding Carbureter. This device, shown below and in more detail on the next page, differs from the ordinary fuel vaporizer in that the usual small jet orifices are lacking. In addition to this, the throttle valve, so-called, is automatic in its action, which not only governs the inflow of air, but regulates with absolute certainty the flow of gasoline as well.

To describe it more in detail, there is a float chamber, circular in section, containing a float of the conventional type, but working directly upon the needle valve seat through its lightness, and consequent position in the fluid only. That is to say, there are no levers or springs in the needle valve arrangement.

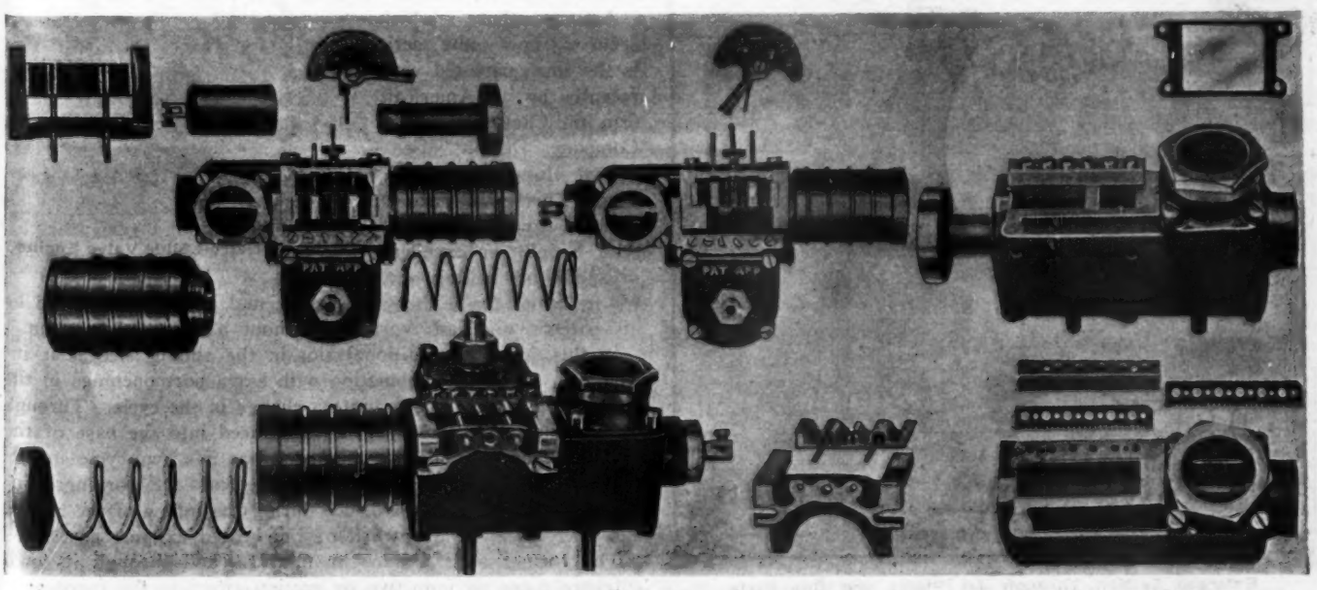
Leading from the float chamber to the jet plates—for plates are used instead of needles—there is a long and very narrow slot, which replaces the usual round hole. This slot extends upward to the jet plates. The latter are five in number, held in place by means of bolts. In each one of these plates one edge carries a series of square key-hole slots, between each two of which is located a rectangular slot. When set in place the key-hole slot in the first plate is directly below a rectangular slot in the second. This, in turn, is surmounted by the key-hole slot in the third, the rectangular hole in the fourth, and the key-hole slot in the fifth. The width of the slots, that is, along the edge where the gasoline flows through them into the vaporizing chamber, is .016 inch on the smallest size made, and .018 inch on the largest size which has yet been put out.

In this manner, as the enlarged section through the jet plates shows, every other plate has openings which are connected on the inside to the gasoline supply, and on the outside to the vaporizing chamber. More than this, the openings into the latter vary in each row of plates, one set or series being of the first, third and fifth plates, and midway between these are another set or series of slots in the second and fourth plates. These being very small, and, consequently, very close together, what is the equivalent of five very flat and very thin sheets of gasoline are sprayed into the vaporizing chamber.

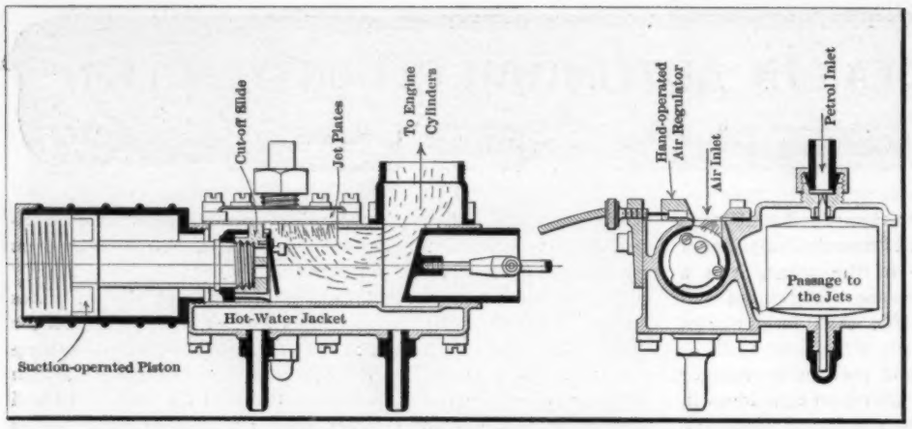
Throttle, Too, Acts Differently—This action just described would be the case, but for the fact that the throttle, of the piston type and working automatically, covers part of these slots. That is, according to the demands of the motor, it either uncovers or covers enough so that the mixture is right. This acts to uncover more and more of the slots through the inductive action of the mixture or the suction of the engine. Opposed to this action is a large diameter coil spring, made of small sized wire, and comparatively weak. Between the motor suction and the strength of the spring there is a constant adaption to the engine requirements. Since the air to vaporize the fuel enters from above the sheet of fuel, the action of the automatic throttle also cuts off the air, at the time it cuts off the gas.

The passage through which the air enters, however, is U-shaped, and may be varied at the will of the driver by means of a sliding member. This is actuated by means of a bowden wire mechanism, the slack being taken up at all times by contrary-acting springs.

In the cut below the large piece in the lower central part is the assembled carbureter. Directly to the left and right, respectively, are the automatic throttle spring and piston, and the air slide. This slide is shown in plain view in the upper left-hand corner, below which is the cover for the piston, or the chamber in which it acts. In the lower right-hand corner is to be seen the body casting, viewed from above, and directly over this a few of the jet plates in actual size compared to the rest of the



Assembled and Partly Dissembled Parts of the Polyrhoe Carbureter, a New English Invention Which Has Proved Its Worth



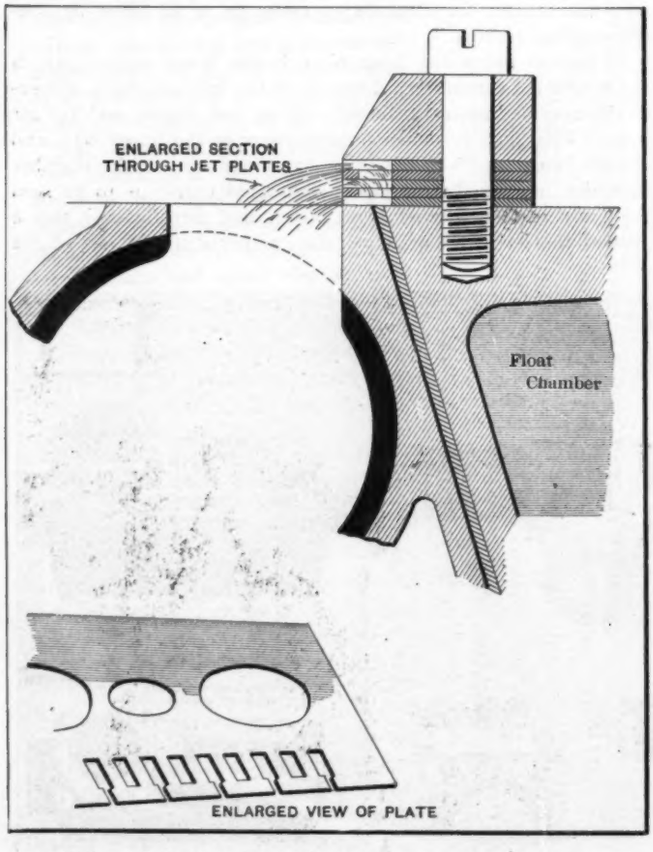
Section Through English Carbureter and End Elevation of Float Chamber

parts. In the upper right-hand corner is the gasoline strainer. The rest of the parts are self explanatory, but it should be remarked right here that several of the parts are shown more than once to make the whole construction clear. As shown this would appear to have many parts, which is just the opposite of the actual case, the parts being few in umber.

The actual throttle, operated by the driver of the car, is also of the piston type, this being set into the other end of the vaporizing chamber, so as to slide across the bottom of the vertical outlet to the engine. The absence of jets of the usual type eliminates the usual accompaniment, flooding. This is particularly noticeable when, running at high speed, the engine is cut off suddenly. This severe test always floods the ordinary carbureter, but this one, never.

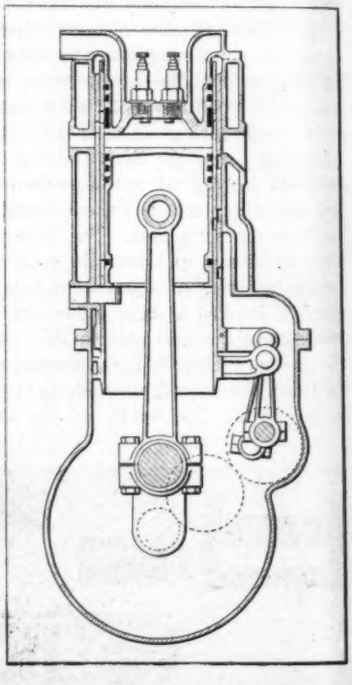
Among other tests to which the new device has been put—for it has been thoroughly tried out—may be mentioned the following: Ten horsepower, two-cylinder Panhard, weighing 2,100, with two passengers and 150 pounds of baggage, averaged 30 miles per gallon; 10 horsepower, one-cylinder Adams averaged 37 miles per gallon; a 10 horsepower, four-cylinder Humber, with two passengers, a top, wind shield, and some baggage, averaged 35 miles per gallon; and an 18 horsepower, two-cylinder Wolseley-Siddeley car with two passengers averaged 26.8 miles per gallon. In addition to these tests, a six-year-old Panhard machine with four cylinders, 80 mm. by 120 mm., was run for a very long time at the exceedingly low speed of 160 to 180 revolutions per minute. This latter was done, too, on a normal, and not a special, adjustment of the carbureter.

Over and above any possible claims, the above actual tests show that the device possesses much merit. This is not to say that no claims are made for it, because the inventor claims that over the whole range of engine speed and power the mixture remains constant and perfect. More than this, he agrees to sell the carbureter on a basis of 19 miles per hour guaranteed, and higher figures if properly paid for. Naturally, in view of these claims, the selling price is rather high, varying from about $33 for the smallest size up to about $45 for the largest. These figures would be net, in England.



Enlarged Section Through Jet Plates and One Plate

Slide Valve Era Is Upon Us—In the past twelvemonth, those who thought that the automobile engine had at last assumed a permanent form have been shown to be in the wrong. Now, just to go to the opposite extreme, following upon the heels of the American, Knight, whose success with the Daimler people has been wonderful, the whole country has gone crazy over this form of engine. Designers are producing all kinds of substitutes for the poppet valve, some good, some bad, and some weird and wonderful, to say the least.



Chalmers-Detroit Slide Valve Engine

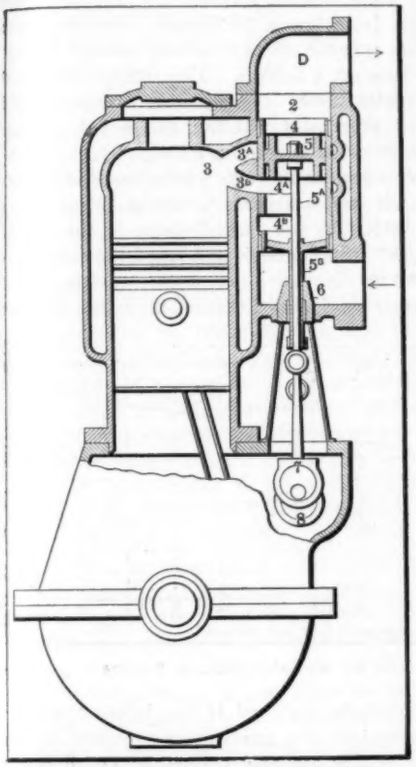
Among those which seem to show some merit is the form patented very recently by an American firm, the Chalmers-Detroit Company, Detroit, Mich., shown elsewhere on this page. This would seem to indicate some agreement with Knight, or excellent prospects of making one, for its basic idea is the same as his, and, therefore, covered by his patents, and not workable without a license from him.

In this form an additional slot in the sliding sleeves is introduced, which in combination with extra port openings in the walls and a bypass makes quite a change in the cycle. Through this medium, cool, fresh air is introduced into the base of the engine, where it is slightly compressed as in a two-cycle engine. This slightly compressed air is introduced into the working cylinder twice during each cycle,once during the inflow of the charge and once during the outrush of the heated exhaust gases.

The former adds air to the mixture, and through its own entrance gives an inductive or suction effect to the more pure

gas entering in the regular way. Through having the whole suction stroke given up to the inflow of nearly pure gasoline vapor, while the air enters independently, a more even and certainly more thorough, charge is obtained.

Similarly with the exhaust, the air under pressure rushing into the cylinder at about the middle of the exhaust part of the cycle serves to push the rest of the burned charge out quickly, and if it does not clean it out more thoroughly than in the usual case, at least dilutes it to such an extent that any bad effect from its remanence in the cylinder during the gas inflow is completely offset.



Engine With Two Slide Valves, One Within the Other

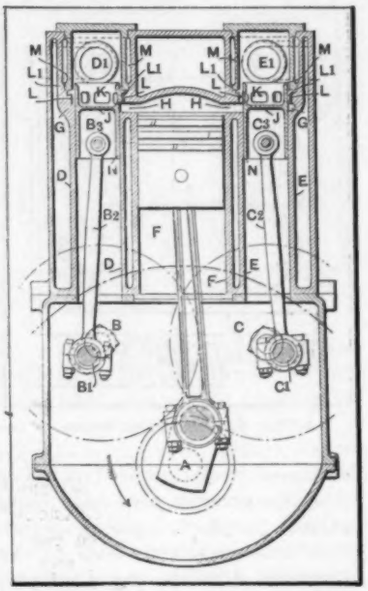
To accentuate the crankcase compression—for that is where the air is compressed—the piston is made very long, while the inner of the two sliding sleeves is carried down further at the bottom than Knight carried his. The head and sleeve construction otherwise is the same as Knight's, at least that is the way the English patent office drawing shows it. Whether this invention will ever be worked on this side is doubtful as this company has no factory over here, so that the first developments probably will appear in the United States.

Piston Valves Supplant Poppets—In the illustration elsewhere on this page is shown an English engine, which has just been brought out, and in which the ordinary poppet valves are replaced by piston valves. These are concentric, one being in the form of a piston, while the other forms a concentric sleeve around it. Both are driven from the camshaft by means of eccentrics and connecting rods, the one for the piston working within the one which operates the sleeve.

In this way the operation of the valve is positive on the down stroke as well as the up stroke, the uncertainty and wavering of the ordinary spring-closed valve being replaced with the absolute certainty of a mechanically closed valve.

As the illustration shows, the cylinder (3) is made with two passages (3a and 3b) to the valve chest (2), within which the valves slide up and down. The sleeve (4) also has two slotted passages (4a and 4b), which are alternately covered and uncovered by the movements of the piston (5). The latter is operated by the rod (5a), while the sleeve is moved by the tubular rod (5b). These slide within the guide (6), and the movement is supplied by the two eccentrics (7 and 8) on the camshaft. Above the valve chest is seen the exhaust pipe (D), while lower down is the inlet opening, not marked with a letter.

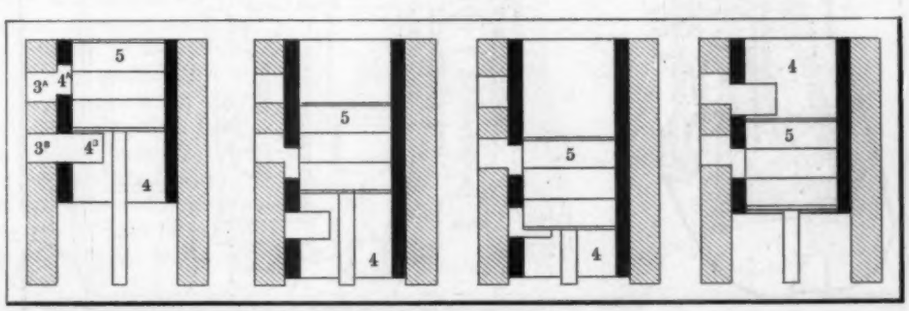
The eccentrics are so set on their shaft that, on the admission stroke, the sleeve (4) travels downwards, the piston (5) meanwhile moving upwards, until the port (4b) registers with the channel (3b). When the main piston reaches to half-stroke on the admission period, the port (4b) is fully exposed to the entire area of the channel (3b), and, subsequently, the sleeve (4), continuing its downward movement, cuts off the admission with swiftness at the outer dead point of the main piston. During the compression stroke, the sleeve (4) is still running down, while the piston (5) is likewise traveling down slowly, thereby covering the port (4a) in the sleeve (4). Upon completion of the compression stroke the center of the piston (5) is opposite to the port (4a), which latter is then almost in alignment with the channel (3b). At this period the port (4b) is right down below both the channels (3a, 3b). In this way the internal pressures are withstood not only by the gas-tight sleeve (4), but also by the wide faced inner piston (5).



Albion Engine Has Slide Valves on Opposite Sides

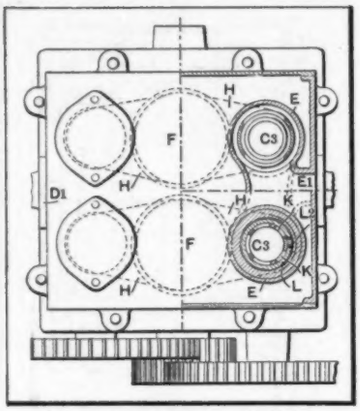
During the combustion stroke the sleeve (4) moves up, the port (4a) thereby ascending towards the channel (3a), while the piston (5) is also moving upwards. When the expansion is nearing its end, both the members (4 and 5) are traveling up, the port (4a) thereby coming fully into line with the channel (3a) when the main piston is approximately at half-stroke in the exhaust period. Gaining speed over the sleeve (4), the piston (5) runs past the port (4a), cutting off the exhaust as the main piston passes its inner dead point. Coincident with this motion, the sleeve (4), having reached its upward limit of travel, comes slowly down, bringing the port (4b) into line with the channel (3b). When the main piston has traveled half its course on the admission stroke, both the channel (3b) and the port (4b) are directly opposite each other, thus affording an inlet orifice of ample proportions. At the termination of the admission stroke the port (4b) in the member (4) runs down swiftly past the channel (3b), thereby cutting off the fuel supply. In order that the operation of the motor may be understood without difficulty, examination of the diagrams reproduced in conjunction with the foregoing information will render its action perfectly plain.

Advantages Are Numerous—Among the advantages which are derived from this construction are that of complete separation of the heated exhaust from the incoming charge by the piston (4), the danger of the one diluting the other being eliminated. Then, too, the design is such that it lends itself readily to



Middle of Admission End of Compression Middle of Expansion Quarter of Exhaust

Slide Valves in Various Positions Throughout the Operation of the Whole Cycle



Albion Engine from Above

water cooling. The valve stems, or what answer to valve stems in the ordinary case, may be lubricated, and are free from the heat of the exhaust. Cylinder pressures and temperatures are withstood better than in the ordinary case, for not only are they received on the outside, but are evenly distributed around the whole circumferential surface by the grooves in the chest. Side thrust is reduced to a minimum and port areas may be accurately proportioned to the desired power or speed.

On the previous page, near enough to the foregoing for comparative purposes, is placed another English piston valve engine. This one has recently been patented by the Albion Motor Car Company, Renfrew, and if reports can be believed, this concern is actively engaged in work on this model of engine, which will soon be placed on the market, as well as being used in the well-known Albion commercial cars.

Slide Valve Displaced by Piston Type on Tee Head Motor— In this engine, the valves are seen to be replaced by pistons, each one displacing one valve. The motor is of the tee head type, so that the change is not as radical as some of the others. The valve, valve lifter and cam mechanism are replaced by the piston valve, eccentric and connecting rod.

The valves are made of a considerable length, so that the opening or passage above is necessarily long, too. This makes the head of the engine very high, and if given over entirely to water jacket, as the patent office drawing shows, would make the engine so cool as to seriously impair the efficiency. This is, however, but a detail of construction.

Within the chest or passage are placed circular orifices (D^1) leading to the exhaust, and (E^1) for the inlet. Communication with these, from the cylinder interior, is effected by means of ports (K) in the valve walls, the same being prevented from ever uncovering the bottom edge of the cylinder wall, by the movement of the eccentric.

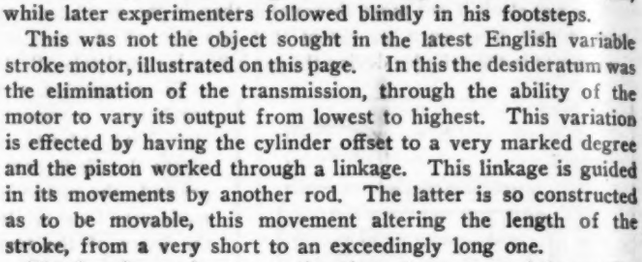
Otherwise the construction is very apparently like any other engine. The elimination of the use of an idler in the camshaft driving gears, however, makes a noteworthy point. As shown elsewhere on the page, this called for unusually large cam gears, and an idler of double width, as the two cam gears overlapped one another slightly.

Object of Variable Stroke Is to Eliminate Transmission— Inventors have worked upon the engine with a variable stroke at various times, and with varying success, most of the engines being little more than schemes on paper. The majority of these, too, sought a more perfect cycle, that is, the object of the variation in the stroke was an improvement in the cycle. Thus, commencing with Atkinson's two attempts in 1885 and 1886, with his Differential and Cycle engines, many attempts have been made. Atkinson's idea, however, was to perfect the cycle, particularly with reference to the length of working stroke and exhaust, while later experimenters followed blindly in his footsteps.

This was not the object sought in the latest English variable stroke motor, illustrated on this page. In this the desideratum was the elimination of the transmission, through the ability of the motor to vary its output from lowest to highest. This variation is effected by having the cylinder offset to a very marked degree and the piston worked through a linkage. This linkage is guided in its movements by another rod. The latter is so constructed as to be movable, this movement altering the length of the stroke, from a very short to an exceedingly long one.

The first figure shows a section through a proposed four-cylinder engine, the one built and successfully tested being but a small single cylinder outfit. In the second figure is the power curve of the "one-lunger" tested, and in the third illustration is to be seen a diagram of the action of stroke variation.

In the latter the letters used are the same as in the first or sectional drawing, A being the real and H the false connecting rod. C is the connecting link and guide, being pivoted to the two connecting rods at B, and movably pivoted at D. F is the double threaded screw through the medium of which the point D is altered, and with it the length of the stroke.

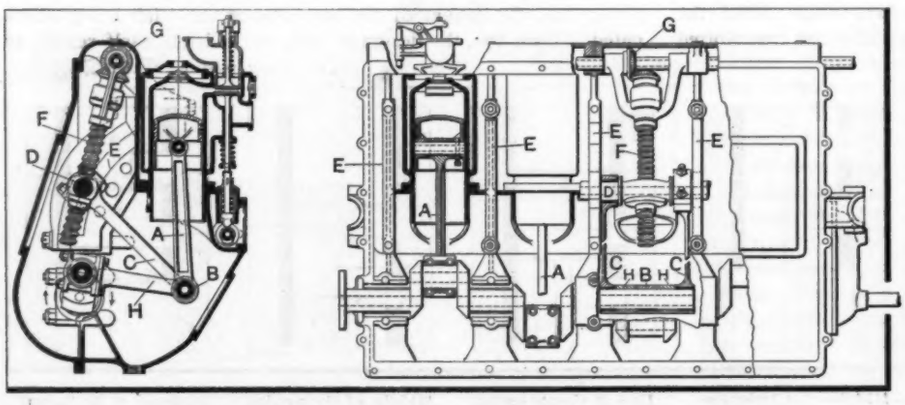


Power Curve of Variable Stroke Engine

This variation is controlled from an overhead shaft, the latter leading back to the dashboard or being actuated through suitable hand or foot levers. Aside from this, the valves, piston and other parts are regular in their construction.

This proposed engine will have four cylinders, nominally of 5-inch bore and 5-inch stroke, the variation in the latter being from a minimum of 2 inches up to a maximum of 7½ inches. This would give a variation in the ratio of bore to stroke of from 1 to .4 up to 1 to 1.5. It is expected that this engine will easily develop 50 horsepower, basing this estimate upon the results obtained in the test with the one cylinder.

Much smaller than this was the experimental engine, which had a bore of but 3 inches and a stroke variable between 1 inch and 3½ inches. This engine would rate by the R. A. C. formula (A. L. A. M.) at 3 horsepower, so that consulting the appended table, the loss due to the added linkages may be seen to be far smaller than one would suppose. That is the question which has held back the progress of this type of engine, the doubt as to the loss which the linkages would entail. In this small, single-cylinder engine, the loss amounted apparently to about 30 per cent, at least that is the amount which the highest power developed lacks of usual output.



Sectional Drawings of Gill-Aveling Variable Stroke Gasoline Engine

Results of Tests With the Experimental Engine

Stroke	Revs. per min.	Piston Velocity Feet per min.	B.H.P.
1 in.	1,700	284	.44
1 in.	1,000	300	.57
1 in.	2,250	375	.58
1½ in.	1,100	275	.7
1½ in.	1,400	350	1.08
1½ in.	2,000	500	1.5
2 in.	1,500	500	1.7
2 in.	1,600	533	1.84
2 in.	2,000	667	2.07
2 in.	2,200	734	2.09
2½ in.	1,050	438	1.6
2½ in.	1,500	625	2.05
3 in.	900	450	1.66
3 in.	1,000	500	1.76
3 in.	1,150	575	1.85
3 in.	1,500	750	2.07
3½ in.	750	437	1.59
3½ in.	850	496	1.74
3½ in.	900	525	1.77

Throughout the tests, the compression pressure was about 85 pounds per square inch for all lengths of piston-stroke, and, although not recorded in the table, we understand that the highest velocity was obtained with a 1¼-inch stroke, when the tachometer indicated 2,400 r.p.m. 320 r.p.m. was the slowest speed at which the engine would run with a 3½-inch stroke, but, with a 1-inch stroke, steady running, at 240 r.p.m., could be maintained. Taking the figures from the third and fourth columns of the table, we have plotted a chart, in which piston-speed in feet-per-minute is represented by the ordinates, and brake-horsepower by the abscissæ; an examination of this chart reveals the interesting fact that the brake-horsepower bears an almost-direct relation to the piston speed, although, for the lower piston-speeds, there is a considerable drop below the arbitrary line of proportion; the decreased efficiency at slow speeds may be attributed to valve leakage, and other causes that are eliminated with increased speed.

Those responsible for the design are J. F. Gill and T. C. Aveling, assisted by A. A. Remington. From the names of the engineers, the new motor is to be known as the Gill-Aveling. Other details than those commented upon are standard, that is, they follow regular automobile engine practice.

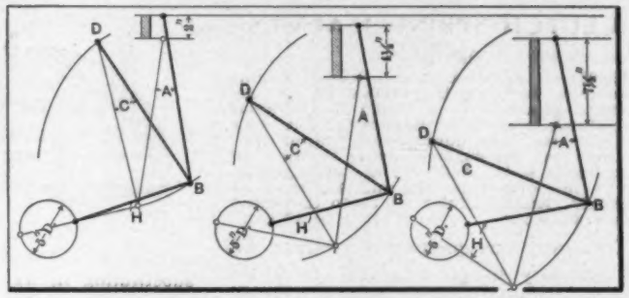
While not an epoch-making machine, by any means, the test curves would seem to give hope to the inventors that they are upon the right track, if they have not actually attained what they sought. The loss of power represented in the rather crude first example is not serious, being but 41 per cent. under the formula. This for a single cylinder, which is of notoriously poor balance, is not at all bad, and the outcome of the tests of the four-cylinder power unit will be awaited with much interest.

Rotary Overhead Valves Another Good Idea—The last figure shows another recent English construction, in which overhead valves are resorted to, these being of an unusual kind. The design, for which W. J. Crossley, of Crossley Brothers, Manchester, is responsible, is an exceptionally good one.

An end section and an end elevation are shown, which reveal clearly the valves themselves, and the driving mechanism. There are two separate valves for each cylinder, just like any other engine, but both of these are circular sleeves, rotating within other sleeves. The inner sleeves are driven from a diagonal camshaft at the front end, which in turn is driven from the crankshaft. A worm gear is used to drive the shaft, and the valves, too, are driven by means of another worm gear.

These valves are set at about 30 degrees each side of a vertical, and communicate with the combustion chamber, which is made spherical, through small slots. In addition to the revolution of the inner sleeves by the shaft shown, a similar shaft at the other end of the engine drives in a similar manner the outer sleeve, the rotation of the two being opposite in direction. That is, the inner sleeve on each side of each cylinder rotates opposite to the outer sleeve on each side of each cylinder. It would appear from the description of this engine as if, in multi-cylinder forms, the sleeves along each side of the engine were made and operated as a single unit, the gas having free access to the exterior and interior in a longitudinal direction.

This would mean, in turn, that the inlet valve sleeve acted as an inlet pipe, and the exhaust valve sleeve as an exhaust pipe, so



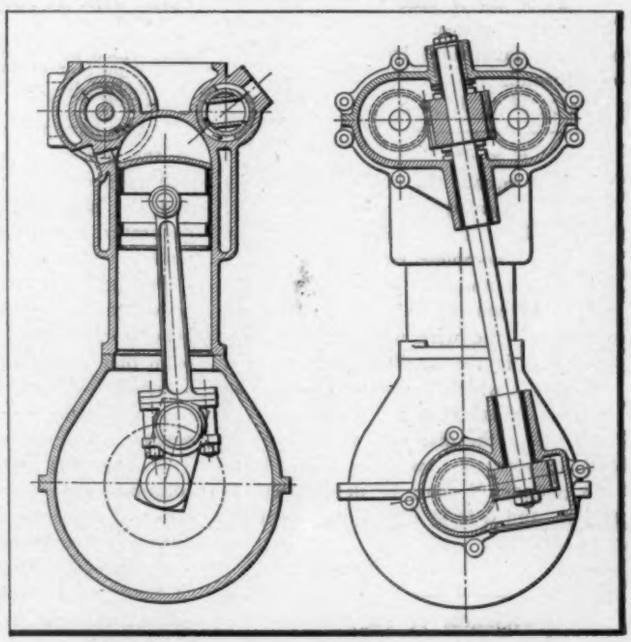
Variations in the Stroke from Lowest to Highest

that all piping of this nature would be eliminated. Then the carbureter would be attached directly to the exterior of the inlet valve sleeve. If this is the right idea a very considerable simplification will result a step in the right direction.

Another English sleeve valve engine, that of A. Reeves, Farnsborough, is very similar to the second one described, in that the ordinary cylinder (Tee-head) construction is unchanged, the valves being simply replaced by piston type of sleeves. He has this change, however, the inner or piston valve is operated in the usual way, with valve lifters, springs, etc., while the sleeve surrounding it is worked from an eccentric, by means of a rod.

It is hard to see that this has any advantage over the ordinary form, as the complications instead of being reduced are increased. More than this, by having the one valve, the inner, and thus the really important one, operated by a spring on the down stroke, it seems as if the biggest point in the sliding valves favor has been lost. The valves were made small in diameter, but of considerable movement, which gave to the valve chest, if it may be so called, a very long and narrow shape that was not displeasing to look at. The requisite amount of port opening was obtained by making the slots or ports very wide or high. The length would seem to call for rather high speed of valve movement, which in turn would seem to nullify the gain from height of valve port.

At any rate, whatever may be the merits and demerits of the various types of engines, and other parts described, their design, construction, testing and public appearance would all bear out the contention that whether intended or not, the Knight engine upset all the traditions of the automobile world, as to form of engine, some of which had been ten years in the making.



Crossley Engine With Overhead Sleeve Valves

CLUTCH SPRING VALVES

Editor THE AUTOMOBILE:

[2,082]—I have a four-cylinder engine, four-cycle, bore 4¼ in., stroke, 5¾ in., and wish to attach a cone clutch to the same. The clutch is of 14 in. diameter, 2¼ in. face, and 10 deg., included angle, faced with leather. Is this surface ample to use with a spring of ¼-in. steel of 2-in. inside diameter, 6 in. long extended and 4¼ in. compressed? Kindly advise me as to the above.
Canaan, Conn. A. E. MOLANDO.

To answer this question correctly, it will be necessary to go into the clutch and spring problem rather deeply. It will also be necessary to know something about the power which the engine will develop. If we take the latter from the A. L. A. M. tables, and add a little to allow for the increased length of stroke, as well as to make an even figure to work with, we get 30 horsepower at 1040 r.p.m.

With this as a starter, the required spring pressure to transmit through the cone clutch described will be found using the formula:

$$P = \frac{H\,P \times 63{,}000 \times \sin \Theta}{f \times r \times R}$$

in which, P equals the necessary spring pressure;
H P equals the horsepower;
R is the speed at which this power is transmitted;
sin Θ is the sine of the clutch angle;
f is the coefficient of friction and
r is the mean radius of the clutch.

Supplying the required figures in this case, assuming the mean diameter as 13 in., which would make the mean radius 6.5 in., and assuming the coefficient of friction as .25, then we get the following:

$$P = \frac{30 \times 63{,}000 \times .174}{.25 \times 6.5 \times 1040} = 19.4 \text{ pounds.}$$

This spring pressure may be resolved into spring dimensions by using the well-known formula:

$$\delta = \frac{64 \times N \times L \times R^3}{E \times d^4}$$

in which δ equals the deflection of the spring in inches;
N is the number of free or complete coils;
L is the load in pounds;
R equals the mean radius of the wire used;
E is the modulus of elasticity, which may be taken as 11,500,000;
d is the diameter of the wire.

Now, in your case, we just found L to be 19.4 pounds, N must be determined, R is 2 ¼ in. and d is ¼ in. Then substituting:

$$1.75 = \frac{64 \times N \times L \times (2.25)^3}{11{,}500{,}000 \times (.25)^4}$$

from this we may evolve the following:

$$N \times L = 111;$$

now, L was just found to be 19.4, so that substituting it, we get

N equals 5.72 coils.

The conclusion then is that the spring will be all right for the clutch and engine described, if the spring has no less than 5¾ coils, or say 6 coils.

Clutch width is determined on a basis of average pressure, never exceeding a figure of 45 pounds per square inch. It is figured as follows:

$$W = \frac{z}{F \times 2\pi \times 45}$$

in which F is the same as r in the first formula, that is, the mean radius of the cone, while z is equal to resulting spring pressure or the axial pressure x divided by sin Θ. This works out from previous figures to 1156 pounds. Then substituting, we get

$$W = \frac{1156}{6.5 \times 6.283 \times 45} = .65 \text{ in.}$$

It is at once apparent that the width which your clutch has is ample, being about 3 times as wide as is necessary, according to the formula. The answer to your question is that the clutch is very apparently all right, with the single proviso that the coiled spring must have 5¾ or 6 full coils.

KEEP GENERATOR WARM

Editor THE AUTOMOBILE:

[2,083]—Will you please tell me of some mixture to put in the tank of my gas generator, which will keep the water from freezing. I have no fear of radiator trouble, but am a bit worried in regard to the gas generator.
Corning, N. Y. J. H.

If you have reference to the water within the generator, anything added to this will reduce the amount of gas generated, and the ease and celerity with which the generator functions, that is, will have a tendency to clog it up.

On the other hand, if you refer to the water jacket around the outside of the generator, you can use anything you want to in that. In the past two or three weeks a number of anti-freezing mixtures have been given in the columns of THE AUTOMOBILE. Any one of these may be used.

On page 604 of the Oct. 7 issue, alcohol solutions were discussed in much detail, a curve of freezing temperatures of different mixtures being, both for denatured and wood alcohol. Then, in an earlier issue, that of Sept. 30, a similar curve was given for calcium chloride, showing how solutions of that vary as to freezing. On this page, you will find something about kerosene.

BRAND NEW ANTI-FREEZE

Editor THE AUTOMOBILE:

[2,084]—I would like you to inform me through "Letters Interesting, Answered and Discussed," as to why kerosene oil, commonly called coal oil, is not universally used in automobiles for anti-freezing purposes. I have heard of some individuals using it successfully and an all-kerosene solution is much cheaper than 25 or 30 per cent. alcohol solution. Maybe it is injurious, or what is the matter? Would offer as a suggestion to those using alcohol compound to plug up the overflow pipe when not in use to prevent the alcohol part from evaporating through the same, which would weaken the compound so it would have a lower freezing point than was originally intended. J. C. BROWN.
Riley, Wis.

The last suggestion is a very good one, and should be brought to the attention of every automobilist using the alcohol solution. A cork could be carried around in the vest pocket for this purpose, and slipped into place every time the car was brought in from a run.

The first suggestion, on the other hand, is not a good one. Kerosene would be objectionable in that it would coat the walls of the radiator with a thin film of oil, and impair the conducting qualities of the metal composing those walls to such an extent as to reduce the capacity of the radiator for radiating heat to about one-third (1-3) that of the same radiator without an oil film. Worse than this, did you consider the effect of warming up about ten gallons of kerosene, and perhaps, holding a match over the vent pipe of the radiator?

If you did not, consider it now, for the result would be that you would make an unusually quick trip into the next county, if not into the next world. All kerosene needs to put it on a par with gasoline for explosive purposes is heat externally applied, just as the cylinders at about 250 degrees or possibly 300 degrees would supply. It seems as if the disadvantages of this scheme far outnumber and overbalance the gain.

Kerosene could not be used with water either, as oil and water will not mix. This makes it necessary either to accept your scheme as a whole or reject it as a whole. The latter is the best way, unless you "hanker" to visit the next county (or perhaps the next world) as indicated.

Why anyone would want to use a fuel for cooling purposes, is hard to explain, when it is an easy matter to get a real cooling mixture from substances, which never could, would, or should ignite, burn, or explode under any conditions whatever. The thing to do, is to get up a brand new cooling mixture from chemicals not now used, which will be superior to anything now in use.

ANSWERED AND DISCUSSED

KEEPS TO THE RIGHT

Editor THE AUTOMOBILE:

[2,085]—I drive a 1909 six-cylinder car, which has always had a tendency to steer to the right when running over an ordinary pavement or country road. The manufacturer has on different occasions replaced front axle, steering knuckle, and lined up the wheels, but the car still runs to the right. Do you think the trouble is in the steering mechanism, which is a screw and nut design? F. S. HARRISON.
Cleveland, O.

Whether the manufacturer changed any of the parts or not, it is a truism that if the car does not run straight normally, something must be out of true. The first thing to do is to find out what that is, so as to be able to correct it.

To go about this in a systematic and thorough manner, run the car onto a large, smooth, wooden floor, being particular to select a smooth one, as you will want to mark upon it. Then, with the car in an advantageous position, turn the front wheels straight ahead, or as near so as possible, and set the brakes.

Next secure a long steel square, such as carpenters use, being sure that both legs are more than 18 inches long. In addition, you will need a plumb line and bob. Using the latter, plumb down, or to put it otherwise, project, the front inside points of the frame as indicated on the sketch at A A. Having located these on the floor accurately, draw the line A-A to connect them. Bisect this at B, which will represent the center point of the front end of the car.

At the rear, project the corners C C, connect them with the line C-C, and find the center as at D. Draw the line B-D, which will represent the projection of the center line of the car. Now, with your square, project the front and rear points of each of the front wheels, in succession, as shown at E E, for the left front wheel, and F F for the right. Connect these by the lines E-E and F-F, to represent the center lines of the two wheels. In projecting the wheel points take particular care, in fact, to get these right you may have to project first one side of the wheel at the front end, then the other side, taking the center between the two as the actual center, and repeating for the other points.

Do the same for the rear wheels, obtaining the four points, G G and H H, from which draw the wheel center lines, G-G and H-H. Now, these may be bisected to obtain the centers at I and J, or the center of the hub cap or similar points may be projected to obtain it. In either way, obtain a projection of this center point on each side, and connect the two with the line I-K-J, K being the point where this line intersects the car center.

Going back to the front axle, project both sides of both ends, as at L L for the left end and M M for the right end. Take half of the difference between the two, being sure to do this accurately, and through the two resulting points, N and O, draw the front axle center line, prolonging it beyond the wheels as at Q-N-R-O-P. R will be the point of intersection with the car center line. Now, if you like, the car may be moved out of the way,

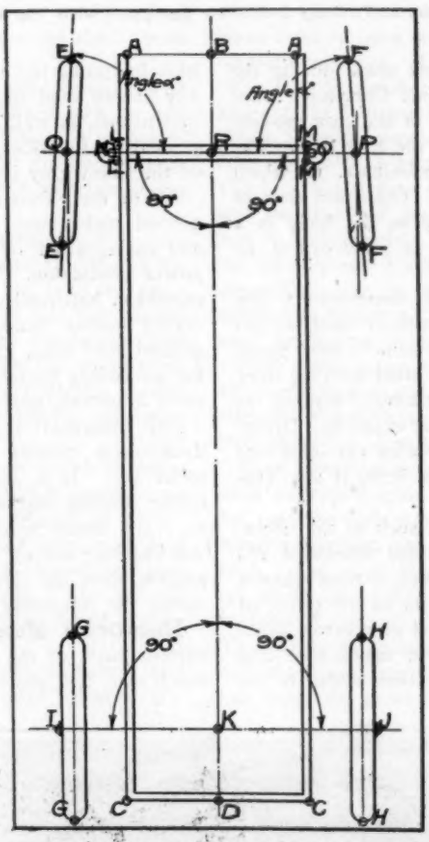


Diagram Showing Method of Lining Up Car

since all of the desired points have been obtained, and from these the car may be checked up, without the car itself.

Summing up the requirements for straight ahead running are four:

1. The angles NRK and ORK of the front axle center line with the car center line must each be exactly a right angle, that is, just 90 degrees.

2. The angles EQR and FPR of the front wheel center lines with the front axle center line must each be exactly the same, whether equal to 90 degrees or less, the latter being the more usual case.

3. The angles IKB and JKB of the rear axle center line with the car center line must be just exactly 90 degrees, a right angle.

4. The center lines of the rear wheels G-G and H-H must make exactly the same angle with the center line of the car, DKRB, whether that be 90 degrees or less, the former being more usual.

Having done this, you will know where you are at. It may surprise you to read the last two conditions, as the average owner has an idea that the alignment of the rear wheels has little or nothing to do with the straight ahead steering of the car, but such is not the case. The effect of disalignment of the rear wheels is very noticeable, in fact, it was one of the "bugaboos" which helped to make the chain-driven car less popular, the two chains having a tendency to pull differently, and thus pull one end of the axle.

In answer to your question, the type or construction of the steering gear would have little to do with a trouble of this sort, although it might be so connected up to the steering links as to pull to one side when apparently set to the middle of its throw. This could be corrected by simply turning the wheel a little farther to the one side.

MUST HAVE SOME NOISE

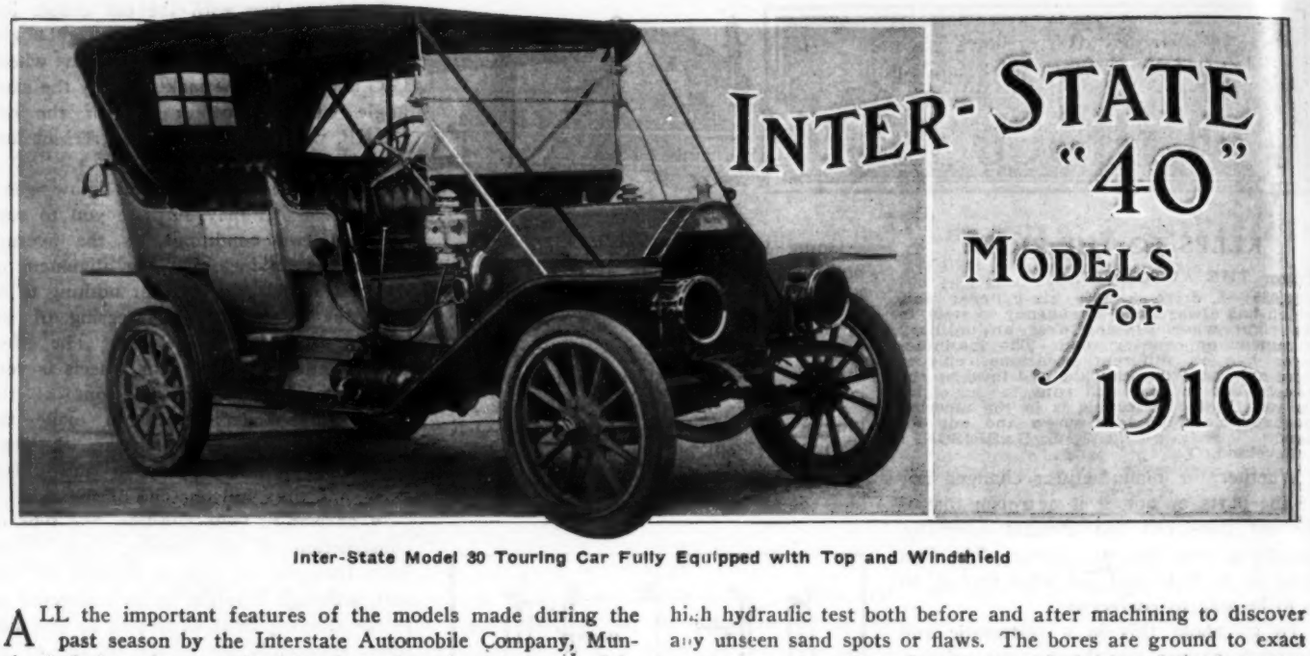
Editor THE AUTOMOBILE:

[2,086]—About two months ago I bought a Chalmers-Detroit "30" 1910 model, and am very well pleased with it in every way except that the differential produces a humming sound like an electric car. Some tell me to put in castor oil, and still others say graphite. I would appreciate it if you would tell me how to stop this humming, and also what causes it. G. D. STOLLENWERCK, JR.
Uniontown, Ala.

Some little noise in, or rather from, gears which mesh and run continuously is unavoidable. You can, however, reduce this very materially by using one of the lubricants spoken of. Between the two mentioned, the preference would lie with the latter, that is graphite. This should not be put in as clear graphite, but added to oil in about the proportion of a tablespoonful to a gallon of *good* oil. Note the italics. You should always use good oil, selecting it with the greatest of care, as much so in proportion as you would use in selecting a car. Running in oil of first quality, the gears will make as little noise as it is possible to have.

Another thing that you should remember is that gears, like cylinders and pistons, run in after a while, and then make much less noise than when new. From the record of the length of time you have had the car, it would seem as if you might begin to expect an improvement in this matter any time now, depending, of course, upon the amount of use which you give the car.

It is just barely possible that the shape of the differential case is such as to act as a sounding board for all noises which the gears make, thus really magnifying what little noise there is. Should you find this so, coat the inside with shellac.



Inter-State Model 30 Touring Car Fully Equipped with Top and Windshield

ALL the important features of the models made during the past season by the Interstate Automobile Company, Muncie, Ind., have been retained by the makers in the 1910 models, the details of which are now given out for the first time. The line consists of one chassis of 118-inch wheelbase, to which three standard types of bodies will be fitted. These will then be known as Models 30, 31 and 32, according as the body is a touring car, demi-tonneau or close coupled as some call it, or runabout, respectively.

Any or all of these—they are practically the same—sets a new value in the automobile world in that the worth of material, design, and workmanship for the money asked, is more than usual The wheelbase is long, the wheels are big and fitted with big tires, the springing is excellent, all of which go far toward making the riding qualities of the car as good as could be expected. Granting that all this may be had in a medium-price car—this one belongs in the $1,500 class—there seems to be little, if any, reason for paying more or looking farther.

Some changes have, of course, been made, such as the necessary refinements of detail, added to an increased wheelbase and larger cylinder bore, an improved type of clutch, a three-quarter elliptic rear spring suspension and more room in all styles of bodies. There is nothing omitted which could give better satisfaction in reliable running qualities, graceful appearance and economical up-keep. Improved features have been added in the later production, but only those which have been accepted universally as possessing exceptional merit.

Among the motor changes are an increase of the cylinder bore, a larger cam shaft, the adoption of hardened and ground steel rolls in the push rods, giving frictionless rolling contact on the cams; a water-pump case integral with crankcase, and a rotary-gear oil pump on the outside of crankcase.

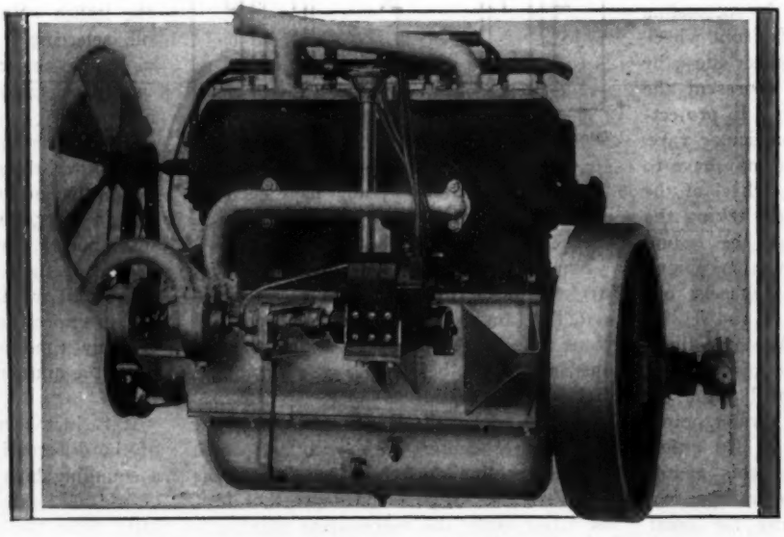
Four vertical cylinders with integral water-jackets and cast in pairs are given a high hydraulic test both before and after machining to discover any unseen sand spots or flaws. The bores are ground to exact dimensions, as well as the pistons and rings, and the latter are ground on the sides, assuring interchangeability. All are made of the finest gray iron.

All of the valves are located on one side with hardened and ground nickel-steel heads and ground stems, and both valves and passages are of large diameter, giving a high efficiency in power production. Valves are operated by a large single-piece camshaft, hardened and ground mechanically correct from generated master cams. The push rods contain hardened and ground steel rolls, giving rolling contact on cams, and eliminating all sliding contact on the cams. The whole construction assures a smooth, positive and noiseless action.

The crankshaft is made from a special carbon-steel forging, double-heat treated, and all bearing surfaces are ground to exact size. It is supported by three large main bearings, the center bearing support being integral with the crankcase. The rear and center bearings are adjustable for any possible wear. All bearings are of the very best bearing metal, which, in connection with the efficient lubricating system, assures long life under the unusually severe conditions met with.

High-Grade Materials, Aluminum and Vanadium—For the various parts of the car, the materials have been selected with much care, this, too, without any regard for the price. The light weight of aluminum is well known. So, too, is its high price per pound. Yet this medium-priced car uses it, and in large quantities, because the designers of the car considered it needed to round out the whole design in a proper manner.

This is the material of the crankcase as well as the gearcase. The former is accurately machined by the use of many and various jigs, the expense of which is ungrudgingly borne in the desire for absolute accuracy and interchange-



Magneto and Pump Side of Inter-State 40 H.P. Motor

ability. The oil reservoir is bolted directly to the bottom of crankcase. This is easily removed for adjustment or inspection of camshaft, crankshaft, connecting rods, or push pin rollers. It gives an accessibility which cannot be questioned, and still gives a very rigid crankcase. The lubrication is accomplished by the constant level splash system with a sight-feed indicator of latest type on the dash, indicating the flow of oil at all times from the reservoir to the crankcase. The constant level is maintained by a rotary-gear oil pump located on the side of the case and driven by the water-pump shaft. The oil reservoir holds two gallons, and receives the return from crankcase by gravity.

Motor cooling is effected by a fan-cooled radiator of the latest type and a fan flywheel, assuring perfect cooling at all times. A positive system of water circulation is maintained by a gear-driven centrifugal pump, the case of which is integral with the crankcase. Radiator cooling is by a ball-bearing fan, supported from motor and driven by a belt from the crankshaft.

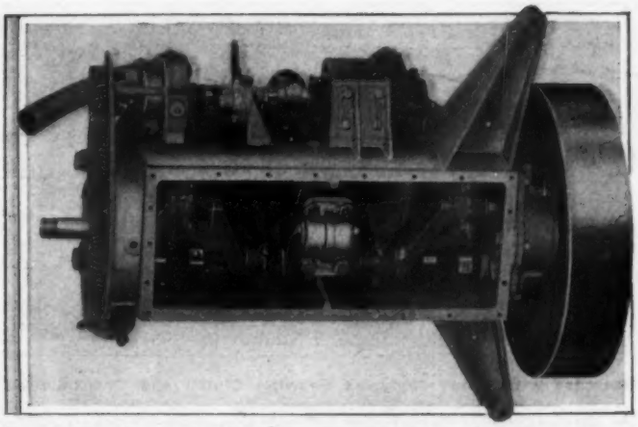
Ignition consists of two separate and distinct modes with a separate set of plugs for each system. The batteries, four-unit coil, timer and set of spark plugs constitute the first, and the second, a U. & H. imported high-tension magneto, with a separate set of spark plugs. Magneto is mounted on a standard of the crankcase and is directly connected to the pump shaft by an imported coupling.

The pump shaft is gear driven by a helical gear meshing with a helical camshaft gear and all gears are covered with an oil-tight case. The entire timing gears are of helical type, otherwise known as spiral gears, and they represent the highest type of high-speed gearing known, where smooth and noiseless action is required.

Helical Gears One of the Modern Refinements—This use of spiral gears, with their extra expense of cutting, indicates the modern trend toward the ultra-quiet car. This form of gearing is well known for its silence, and is used for that reason solely. The great cry nowadays is for quiet, absolutely quiet cars, and to answer, or rather, to forestall this, the spirally cut gears are used. The efficiency of well-cut gears of this variety being high, the losses to counterbalance the silence are practically negligible.

Gasoline is supplied by gravity pressure from a tank of large capacity and set high enough to assure a sufficient pressure on any grade likely to be encountered. The carbureter is of the latest float-feed type, having a visible gasoline level and easy and positive adjustment. It is automatic in its action and provides the proper mixture for all motor speeds. The throttle valve is controlled by a hand lever on the steering wheel and by a foot accelerator pedal conveniently located.

The drive is taken from the motor by a double universal joint of improved design, which can be disconnected without disturbing either motor or transmission, is practically noiseless, and easily lubricated, all important features.

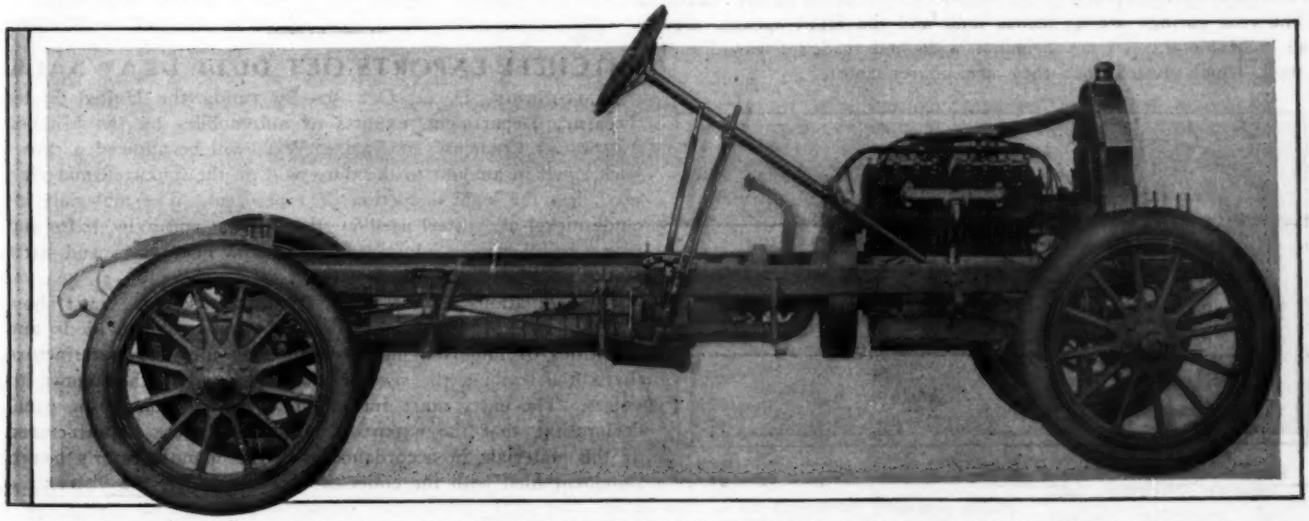


Crankcase Showing Bearings as Seen from Below

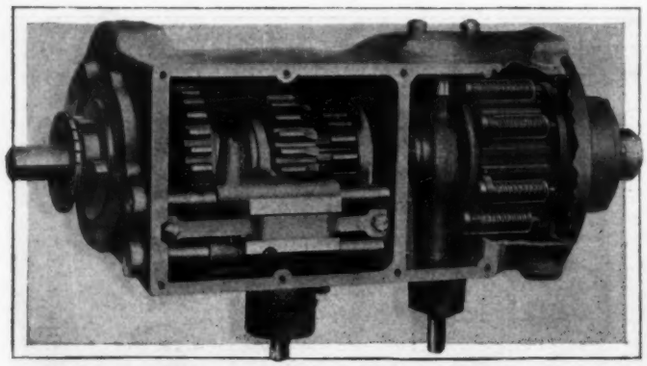
Features of Transmission and Clutch—An improved form of disc clutch is used, comprising 63 plates of tempered saw-blade steel running in a separate compartment integral with the transmission case. The large number of steel plates gives the same smooth positive action as from the use of bronze and yet has not the fast-wearing features of the bronze discs. A ball-thrust bearing between yoke collar and the clutch throwout yoke ring eliminates a large amount of friction and consequent wear. The clutch complete gives a smooth positive action at all times and the qualities described insure long life. The clutch tension is maintained by six spiral springs evenly spaced outside of the discs giving a very even thrust on the clutch discs and not depending upon the action of a single spring. This construction makes the failure of the clutch impossible from a single weakened or broken spring.

Inter-State design of transmission is well known for its durable construction and perfect ease of operation. The case is a high-grade aluminum casting, and the shafts are supported throughout on imported annular bearings.

Gear Details Sound Good—Nothing is more important than good materials, good workmanship, and efficient lubrication in the gearcase and gears, which give it the name. In this transmission all gears are of extra wide face and heavy pitch— five pitch being used throughout—and all gears in constant mesh are made of vanadium steel. The sliding gears shift on the four-keyed type of shaft and the keys are integral with shaft. All gearing is generated, hardened and ground, and chamfered with the most improved form of curve. A double locking device holds the gears and shifting lever in position and prevents



Side Elevation of Completed Chassis, Showing Inlet Side of Engine and Rake of Steering Column



Gearcase with Cover Removed Showing Clutch and Transmission

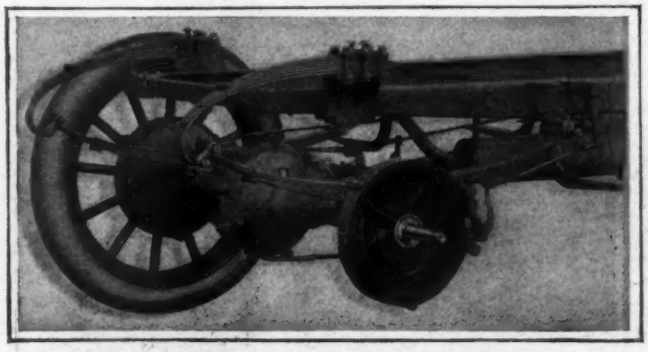
the careless driver from going by neutral position unintentionally.

Round or barrel-shaped is the name given to the gearcase, to describe the form of construction. This is in a single unit, with a large cover plate on the top for inspection purposes, being handy as well for adjustments and lubrications. The one-piece case is not only simple—a very good point—but it possesses added strength over any form of two-piece case, the division of the case representing a line of unavoidable weakness.

Propeller shaft is rigidly supported at both ends and the bevel drive pinion and gear and differential box are housed in an oiltight differential case. All bevel gears are carefully generated, assuring noiseless and efficient power transmission, and all the gears are easily removed. The axle shafts are of large dimensions, and made of very carefully selected steel.

Every motorist should look into the subject of brakes, for following the operation of starting the car, the next most important thing is to be able to stop. With the idea of stopping the car very quickly in emergencies, this one is fitted with four very large and efficient brakes. These are of the latest internal and external type, both working on the same drum attached to the rear wheels, one on the inside and the other on the outside. The two internal expanding brakes are used as service brakes. These are operated by foot pedal and are dustproof. All brake bands are lined with 2-inch thermoid lining and are provided with very simple adjustment. There is no transmission brake used, and, therefore, no stresses are imposed on the mechanism.

What the Springs Show in the Way of Merit—Springing has come to be regarded as one of the big problems of the automobile, and as such the details of the spring suspension of any car are worthy of more than ordinary scrutiny, particularly to the prospective purchaser. On this car an improved rear spring is of the three-quarter scroll-ended elliptic construction, affording more comfortable riding qualities. They are very rigidly suspended outside of the frame side rails and the wide spring base makes a more easy riding action of the car on rough roads. The rear springs are 45 inches long and the front springs are 42 inches long. All are 2 inches wide and made of vanadium steel, which means that they are unbreakable.



Rear Suspension Consists of Three-Quarter Elliptic Springs

Front axle is made of a high-carbon steel drop forging properly heat-treated and of I-beam construction. The steering knuckles are provided with extra large ball bearings fully ground and all connections are fitted with grease cups. The front axle road clearance is 11 inches and the rear axle clearance is 10 inches. The steel mud apron under the motor has an actual road clearance of 11 inches.

How the Frame Adds to the Whole—Since the units comprising the power plant, the clutch, transmission, springs, etc., all rest upon, or are attached to, the frame, that should have special treatment. It is of pressed steel, the channel section being employed to good advantage. The section of the stock used is unusually heavy, and is pressed out cold. The open side of the channel is turned in, so as to present a smooth exterior. At all corners and points where the cross-members are attached, heavy gusset plates are employed to retain the full strength.

Cross-members are four in number, located as follows: One at the extreme front, forming a bed for the radiator to rest upon; one passing under the front end of the engine, and forming the single point in the motor's three-point suspension; one just back of the flyweel and just forward of the transmission, lending stability at this hard-worked point, which comes at the dashboard; and the usual cross-member at the rear end.

At the dashboard, as just described, the bracing is worth special mention. Two unusually long triangular steel plates are riveted to the top and bottom of each side member, the lower one being much wider than the upper all along its length. Upon this widened lower member, the rear feet of the engine, extended in width for this particular purpose, rest thus forming the rear two points in the three-point support.

This unusual extra bracing, coming just at a point where the ordinary frame has its weakest point, is an excellent feature of an excellent car. The three-point suspension, too, is very good.

Engine bore, which has been omitted above, is 4 1-2 inches, while the stroke is 5 inches, the wheelbase is 118 inches, and the tread, standard, 56 1-2 inches. The wheels are 34 inches diameter all around, while the 4-inch diameter tires are also used on all four wheels.

Alumaloyd, the new aluminum-coated sheet steel, is the material for all bodies. This is bent to the desired shapes and used over bent-wood frames to hold that shape. The seats are of number one first quality buffed leather, stuffed with curled hair and fitted with spiral springs.

Unusually complete describes the equipment, which includes two gas headlights, with generator; two oil sidelights, one oil tail light, horn, tube, bulb, large combination tool and battery box placed on the left side of the car so as to leave the right or working side free, or if preferred for spare tires. The set of tools is complete and of the best makes throughout. The spare parts supplied are very complete, enough so to cover all small repairs for a whole season with ordinary careful driving.

MITCHELL EXPORTS GET DUTY DRAWBACK

WASHINGTON, D. C., Oct. 30—By ruling the United States Treasury Department, exports of automobiles by the Mitchell Motor Car Company, of Racine, Wis., will be allowed a drawback equal in amount to the duty paid on the imported materials used, less the legal deduction of 1 per cent. The materials include nickel alloy steel used in transmission and axle shafts and gears, ball bearings, aluminum crank and gear cases and parts of the Splitdorf magnetos.

The regulations set forth that the drawback entry must show the total number of automobiles exported, and the kinds and quantities of imported materials entering into the manufacture thereof, describing the several items as listed in the import invoices. The entry must further show, in addition to the usual declaration, that the exported automobiles were manufactured of the materials in accordance with the manufacturer's sworn statement filed with the collector of customs for the district.

Fig. 1—Model O-3 touring car, with a roomy tonneau, wide side entrance, straight effect and metal body

WITH a brand new shop, ample and modern facilities, designers of skill, and a business establishment of wide experience, the Elkhart Motor Car Company, of Elkhart, Ind., is rapidly crystallizing, and the Model O series for 1910 will comprise some six separate styles of cars, one of which is shown in Fig. 1, and is a touring car, for five passengers, known as Model O-3, selling at $1,700.

A toy-tonneau, designated as Model O-2, using the same chassis, will undoubtedly be a popular type of car, and Model O-1, as shown in Fig. 2, is a roadster of caste. The toy tonneau will sell at the same price as the touring car, but the roadster will sell at $1,700, which is $50 below the touring prices, the difference being in the body.

Bodies All Equal in Point of Quality—The several types of bodies are with ash frames, properly joined, well ironed, and sheet metal is used for panels and doors. Upholstery is in M. B. leather of a careful selection, with spring cushions, and the standard colors of the finish are red, maroon, and black.

The touring car weighs 2,500 pounds, has a wheelbase of 118 inches, standard tread (56 inches), and the load is rolled on 12-spoked wheels, artillery type, using 34 x 3 1-2 inch Diamond tires, front and rear, with provision for 35 x 4 inch tires of the same make as an extra, at the option of the purchaser.

Power Plant Represents Competence—The motor, the right side of which is depicted in Fig. 3, is of the four-cylinder (vertical) type, placed in front, so that the radiator is over the front axle, and in this way the weight is so suspended between the front and hind axle that the performance of the car is superior. The cylinders of the motor are cast separate; of gray iron, with spherical domes, valves in heads, and rockers, R_1, R_2, R_3 and R_4, engaging tappet-rods, which are actuated by means of integral cams on a single camshaft, S, located within the crankcase, on the right side, driven by means of a silent (housed-in) gear, which meshes with a pinion on the crankshaft.

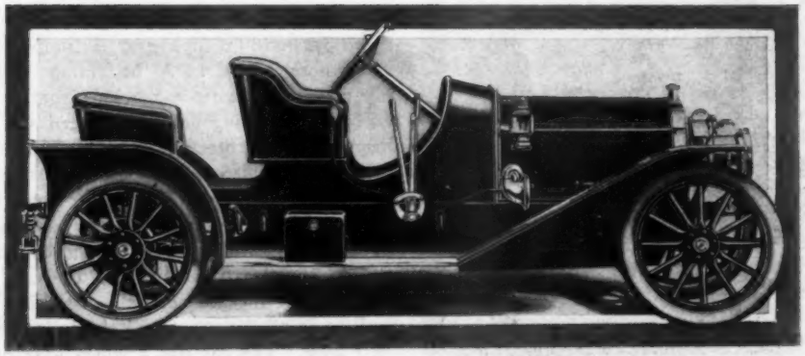


Fig. 2—Model O-1 Roadster type, with runble seat in an accessible position, smart effect on the whole, and speed

The carbureter, C, is also on the right side of the motor, and the manifold, M, is of the equalized type, made of aluminum, and properly proportioned, having in mind the fact that it is just as easy to exceed the requirement as it is to make the sectional area of the orifices too small. The location of the carbureter is advantageous, being high enough to be accessible, and low enough to afford a "hydraulic grade" for the gasoline in its migration from the nozzle to the cylinders, so that if some of it should fail to vaporize it will drain back to the carbureter, and the mixture will not be unbalanced by excesses of liquid being carried over.

Dual Ignition Includes Remy Magnetic—Besides a coil and battery, the latter comprised of dry cells, the Remy magneto is placed on the right side of the motor, on the pads, P, as shown (with the magneto removed), and is driven by a shaft which extends out of the gear housing, H, which meshes with the camshaft gear on the end of the camshaft, S. The ignition system, in view of the character of the devices used and the methods of installation, is up to a fitting standard, and the methods employed for advancing and retarding the spark renders the task of obtaining the maximum power from the motor but a matter of doing so.

The fan, F, Fig. 3, which is placed between the motor and the radiator, is of great capacity, having strong blades of liberal area, set at a well authenticated angle, and driven by a wide, flat belt, B, taking power from the crankshaft, through the good office of the pulley, P. The radiator, of the tubular type, is of adequate area of the cooling surfaces, and water is circulated by means of a gear-driven pump of good capacity.

The power of the motor, due to the use of 4 x 5-inch (bore and stroke, respectively) cylinders, is

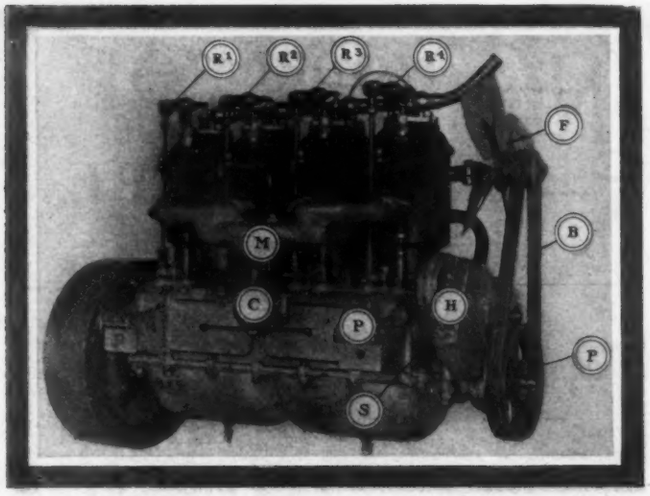


Fig. 3—Right side of Sterling 30-35 motor, of the individual cylinder, water-cooled type, overhead valves, belt-driven fan and furnished with magneto

large for the weight complete, and is rated by the makers at 30-35 horsepower. The crankshaft has five bearings, with a liberal projected area of each, and the motor delivers its power at about 800 revolutions per minute. Under these conditions, considering the use of Parson's white metal journals, it is a reasonable expectation that the motor will last long and work well. The even rotation of the crankshaft, under full load, and at low speeds, is accounted for, in a measure, by the well regulated compression, but the employment of suitable methods of design of the flywheel, considering adequacy of weight, has much to do with the good performance.

Clutch Represents Quality and Novelty—The clutch resides in the flywheel, comprises a cast extension 10 inches in diameter, machined and ground, and two accurately ground rings, side by side, extended by means of a toggle motion, press, at will, against the inner periphery of the ring. There is an entire absence of any facings, and the chances of wear are reduced to a minimum. The toggle motion affords very high surface pressures, and the clutch, while it is soft of engagement, is sure, with slipping eliminated excepting at the will of the driver, which, under certain conditions, is a positive advantage.

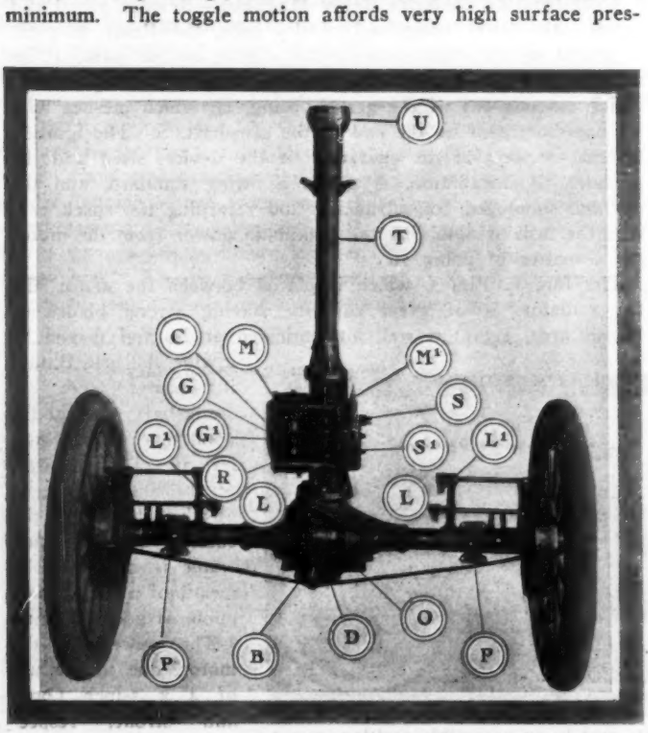


Fig. 4—Live rear axle, with transmission suspended, stout torsion tube, and protected brake levers

From the clutch to the rear axle, as shown in Fig. 4, is by means of a shaft, within a tube, T, on the end of which is a ball and socket universal joint, U, and between it and the bulge of the live rear axle the transmission case, C, is suspended. This transmission, deignated as the "Unit type," gives three forward speeds and reverse, and the direct, as well as the lay shafts, roll on New Departure ball bearings. The figure is from a photograph, with the cover of the transmission case removed, showing the master gears, M and M1, the change gears, G and G1, and the lay gear for the reverse, R, also the sliding sleeves, S, for direct on high and second, as well as S1 for third and reverse.

The bevel drive, by means of a bevel gear and pinion, is bolted to the differential housing, D, and the bevel gear, B, shows, the cover being off for the purpose. The differential gears are of the bevel type, and the case is provided with openings, O, at four points, to facilitate lubrication, one of which may be seen, and one of the differential gears may be spied through the opening. The tubing of the live rear axle is of the usual cold drawn, annealed, and brazed to make-up members of suitable contour.

Brake Control Members Are Inside—The control for the brakes extend in, past the perches, P P, for the springs, and the levers for applying pressure to the brake-shoes, L L and L1 and L1, are so placed as to be easily accessible, and what is equally to the point, out of harm's way. As indicated, there are two sets of brakes, both in drums in rear wheels, and the control is by foot pedal and side lever. The latter being for the emmergency brakes.

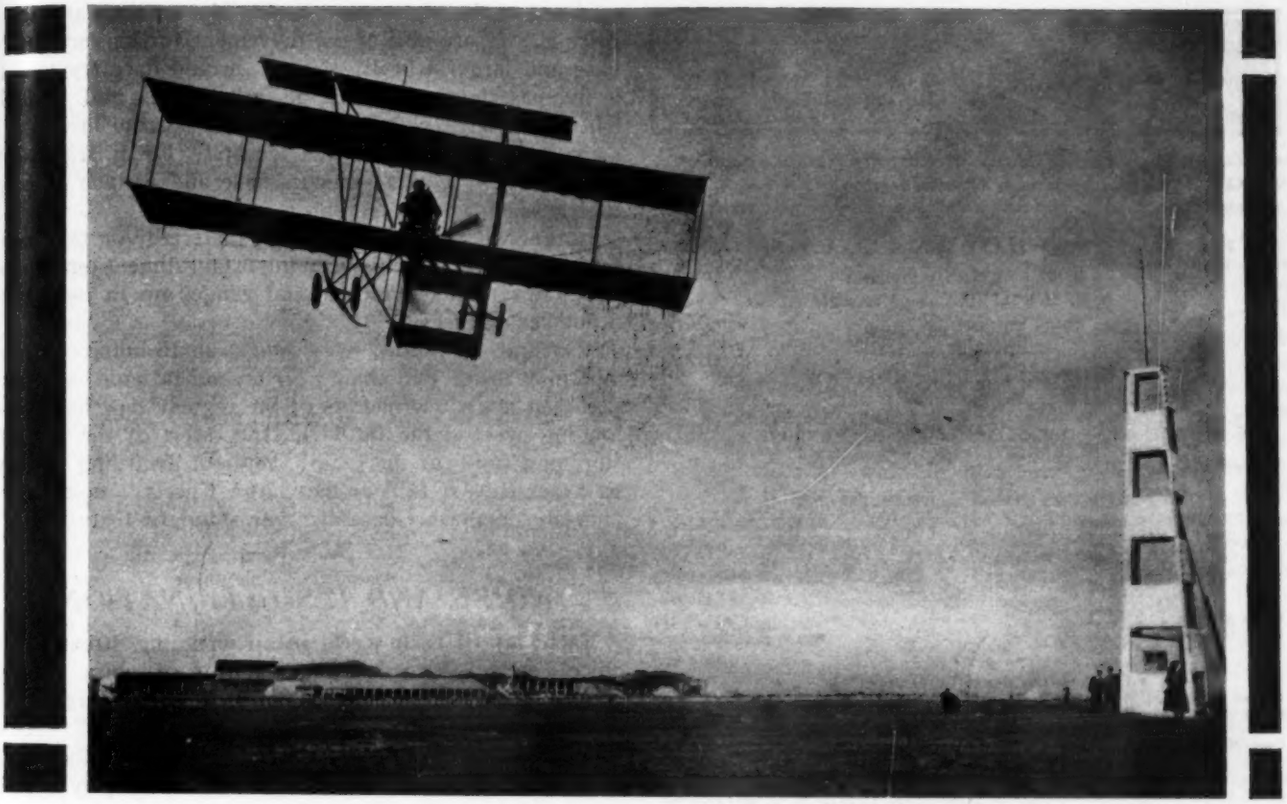
The front axle is of the I section, drop forged from special steel in one piece, and knuckles of good design, of the same grade of material, assure safety and long life free from lost motion. In the front wheels the ball bearings are designed for thrust and radial loading, with 5-8-inch balls inside and 1-2-inch balls outside. In the rear axle, which, by the way, is of the semi-floating type, is provided Hyatt roller bearings.

The chassis frame is a 4-inch channel section, pressed, with 3-inch cross members, and a grade of workmanship to assure the best results. The springs are of special grades of steel, 38 x 2 inch, semi-elleptic, front, and rear springs are of the platform type, 42 x 2-inch side members and 34 x 2-inch cross member, placed at the rear.

NEW ROYAL TOURIST MODELS OUT

In keeping with an old-established policy to avoid all revolutionary changes, and make only those which indicate mechanical progressiveness, the Royal Tourist Car Company, Cleveland, announces that the models for 1910 will be but a continuance of those for 1909 under a different name. The newer cars will be called Model M Series Two.

All of the cars of Series Two will retain the 5 1-2 by 6-in. motor of Series One, this having proved satisfactory in its predecessor. The motor has a speed range of from 5 to 65 miles an hour on high gear, actually developing 65 horsepower, and having an A. L. A. M. rating of 48.4. The manufacturers lay claim to having a machine that is a remarkable oil saver, an oil filter having been introduced and the oiling system having been further protected and simplified. The braking surface in this model is also a feature, being exceptionally large and correspondingly effective. One of the changes which greatly enhance the appearance of the car, is the adoption of a square dash made of Circassian walnut and also the employment of a longer hood, adding greatly to the lines of the car. Alloy steel is used exclusively in the frame, axles, steering knuckles and levers, as well as in all the gears and shafts in the transmission and in the rear axle. The car has a wheel base of 126 inches, 4 cylinders, and possesses all the very latest improvements known to automobile science.



Henry Farman, World's Record Holder for Distance and Duration, Making a Recent Flight at Blackpool, England

NEW YORK CITY PLANNING AERO MEET

Long Island is to have an aeroplane meet rivaling those of Rheims and Blackpool, if the plans of the Aero Club of America materialize. This announcement was brought forth by the return of Orville Wright on the *Adriatic* last Thursday, and the news of Farman's new endurance record on Wednesday. The particular connection between these two events is that Farman's flight was in competition for the Michelin trophy, an annual prize for the longest flight during each calendar year. This prize was won in 1908 by Wilbur Wright, with a flight of 76.5 miles in 2 hours 18 minutes 38 seconds.

The brothers naturally wish to keep it in the family, and although neither has definitely said that he would attempt to beat Farman's record, it is reasonably sure that they will appear at the coming meet. Wilbur Wright is authority for the statement that whoever wins the Michelin prize this year will have to fly from daylight till dark—at least eight hours of a midwinter day. According to the Aero Club's semi-official statement, the meet will take place at Belmont Park race track, near the Vanderbilt Cup course, during the last week of the year.

Orville Wright and Miss Katherine Wright were met at the pier by Wilbur Wright and President C. F. Bishop and W. J. Hammer of the Aero Club of America. The junior member of the partnership has been in Europe since August 10, and has made during this time approximately 100 flights. While in Germany Mr. Wright instructed Captain Engelhart, a retired naval officer, in the use of the aeroplane. He will in turn act as instructor for the German firm that is making Wright machines.

CROSS OF LEGION OF HONOR FOR WRIGHTS

Orville and Wilbur Wright have received the French Cross of the Legion of Honor, the greatest reward which the French Republic can confer, as a recognition of their labors in the field of aviation. The ceremony took place last Saturday at the French Consulate in New York, and Consul-General Georges Lanel, acting in behalf of the President of France, made the presentation.

GOVERNMENT AEROPLANE DAMAGED

WASHINGTON, D. C., Nov. 5—After on one memorable flight showing its possibilities in the hands of the military aviation corps, the Government's Wright aeroplane was badly damaged this morning, and will be laid up for at least a week. Lieutenant Lahm was driving this morning, with Lieutenant Humphreys as passenger. The accident apparently resulted from the faulty performance of the motor, which missed fire badly, causing the aeroplane to sink nearer the ground. The operators apparently failed to notice this, for they attempted a turn, and as the machine heeled over the right wing-tip struck the earth. It looked like a bad smashup, but the only injury sustained by either officer was a scratch on Lieutenant Lahm's nose. The machine will have to have its right lower wing-tip and the right skid replaced.

Wednesday morning the aeroplane made its best record, Lieutenants Foulois and Humphreys remaining aloft for 1 hour 1 minute 45 seconds, falling only ten minutes short of the world's record for flight with passenger. They came down at Wilbur Wright's request, because of the rising wind.

FARMAN'S MICHELIN FLIGHT A RECORD

PARIS, Nov. 3—Henry Farman broke all world's records for distance and duration to-day in a flight for the Michelin trophy at Chalons. He covered 144 miles in the time of 4 hours 17 minutes 53 seconds. It was a cold, gray day, but windless; the aviator's greatest difficulty was to keep his hands and arms from becoming numbed. The best previous records were made by Farman at the Rheims meet last August, when he made 111.8 miles in 3 hours 4 minutes 56 2-5 seconds.

The new record, being made under the officially prescribed conditions, will win the Michelin trophy for Farman unless surpassed by some other aviator before the end of the year. The Michelin trophy was instituted by M. Michelin in 1908. It consists of the sum of $32,000, divided into eight annual prizes of $4,000 each. The winner each year receives in addition a bronze trophy, and the club which he represents a similar trophy.

THE AUTOMOBILE

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ADAPTING CARS TO ROADS

Wiseacres—not all of them of rural origin—used to say, with much shaking of heads, that automobiles would never find much use in the country districts until they were adapted to country roads. Automobiles were fine things, said these prophets, to run on the macadam roads between large cities, and no doubt they were useful and had come to stay, etc., but they were not practical for the farmer's use. The first qualification mentioned was always high wheels.

It is hard to tell who has won. The prophets, of course, say that modern tendencies in automobile construction are the result of considering the demands of the country trade. The automobile manufacturers, on the other hand, say that the tendencies are the result of a natural evolution. It is certain that these developments add immeasurably to the comfort of the occupants, even on the best macadam roads.

At any rate, the automobile makers have taken up large wheels with a will—note, we now call them "large," and not "high." The makers of the buggy or "high-wheel" type of automobile now find that the makers of the more legitimate type have stolen their loudest thunder. In at least two cases the size of wheels of the regulars equals that of the former insurgent type; and in addition to these large wheels, the regulars have a length of wheelbase that gives them a further advantage.

These developments in the regular line are not at all confined to the high-priced cars. The medium and low-price classes are also in the movement for longer wheelbase and larger wheels. No one would dare try to sell a five-passenger car with 28-inch wheels and 80-inch wheelbase, such as we knew to our sorrow in the old days, on the plea that it was "cheap." For a $1,500 car the average is now 110 inches base and 34-inch wheels, with 36-inch not more than a year ahead.

Larger wheels have helped out materially on the question of clearance. This very important dimension is now never less than ten inches, and ranges up to twelve in a number of cases.

"Natural evolution" is a fine, mouth-filling phrase, and may mean something; on the other hand, we suspect that not a few makers of the regular type have cast longing eyes on the fat farm-lands west of the Mississippi and south of the Ohio. Without awarding victory to either side, it suffices that large wheels, ample clearance and long wheelbase are now standard features.

NOISE AND ITS ELIMINATION

Each day of each week, in an unending stream, this office receives letters on the subject of noise. They begin, "How shall I stop the noise of my differential?" "How may I take the hum out of my gears?" "How can I stop the noise of this, and of that, and of the other thing?" Some of these questions are not wisely asked, but throughout all of them there is a great and very apparent tendency toward the absolute elimination of all automobile noises.

Far from lessening with more and more quiet machines, this is a matter which seems to grow constantly worse. In this way, the standard set a few years ago is quickly replaced by a new and higher one, up to which manufacturers bring their cars, only to be met with fresh demands for the abolition of this or that thing, which makes a "little" noise.

First among the remedies applied to this matter was the correct and regular chamfering of clash gear teeth as opposed to the old inaccurate hand trimming methods. This made gear changing more quiet, but then the engine was too noisy. The latter outcry brought out the enclosure of the whole valve mechanism, and the deadening of the lifter and valve stem impact by means of fibre, rawhide and other sound-reducing materials.

Following that, improved valve setting, combined with more efficient muffling reduced the noise of the exhaust to a minimum. Then, some slight improvements in carbureters and carburetion reduced the noises of the fuel inflow to as negligible a quantity as was possible. The enclosure of brakes and some of the brake mechanism helped a little, as did also the universal adoption of the mud pan, with a noise-deadening air space between it and the base of the motor.

But even all these and the reduction in noises which they produced was not enough, and the cry of less noise is probably more heard to-day than ever before. It may be among the possibilities that the success of the slide valve engine when firmly established will help very materially in this direction, for this design of motor does away with the noisy and troublesome valve mechanism, toward the quieting of which much time, thought and work have been devoted.

COL. CLIFTON RE-ELECTED PRESIDENT OF A. L. A. M.

AT the annual meeting of the Association of Licensed Automobile Manufacturers held at the general offices of the Association, 7 East Forty-second street, New York City, November 4, the following officers were elected for the ensuing year: President, Charles Clifton, Pierce-Arrow Motor Car Company; vice-president, S. T. Davis, Jr., Locomobile Company of America; secretary, L. H. Kettredge, Peerless Motor Car Company; treasurer, Col. George Pope, Pope Manufacturing Company. The executive committee of the association is made up of the following: President Clifton, Vice-president Davis, Hugh Chalmers, Chalmers-Detroit Motor Company; Thomas Henderson, Winton Motor Carriage Company; Herbert Lloyd, Columbia Motor Car Company.

In addition to the above-mentioned officers, the following members of the Association were in attendance at the meeting: James Joyce, American Locomotive Company; Elmer Apperson, Apperson Bros. Automobile Company; John S. Clarke and D. S. Ludlum, Autocar Company; W. C. Durant and R. H. Goss, Buick Motor Company; W. C. Leland, Cadillac Motor Car Company; R. D. Chapin, Chalmers-Detroit Motor Company; H. W. Nuckols, Columbia Motor Car Company; M. S. Hart, Corbin Motor Vehicle Corporation; R. M. Brownson, Everitt-Metzger-Flanders Company; James H. Becker, Elmore Manufacturing Company; G. H. Stilwell, H. H. Franklin Manufacturing Company; Elwood Haynes, Haynes Automobile Company; Edward R. Hewitt, Hewitt Motor Company; R. B. Jackson, Hudson Motor Car Company; Alfred N. Mayo, Knox Automobile Company; H. A. Lozier, Lozier Motor Company; F. F. Matheson, Matheson Motor Car Company; Benjamin Briscoe, Maxwell-Briscoe Motor Company; C. R. Hathaway, Olds Motor Works; Henry B. Joy, Packard Motor Car Company; Albert L. Pope, Pope Manufacturing Company; R. E. Olds, Reo Motor Car Company; George J. Dunham, Royal Tourist Car Company; W. Mitchell, Alden Sampson, 2d; R. H. Salmons, Selden Motor Vehicle Company; Frank B. Stearns, F. B. Stearns Company; William R. Innis, Studebaker Automobile Company; E. R. Thomas and E. L. Thomas, E. R. Thomas Motor Company; John N. Willys, Toledo Motor Company; William T. White, Walter Automobile Company, and Windsor T. White, Waltham Manufacturing Company.

LACK OF SPACE AT PALACE SHOW A SERIOUS PROBLEM

JUST how to meet the demands for space of the 300 odd exhibitors in the coming Grand Central Palace Show, which opens on New Year's Eve, is getting to be a more serious problem every year. Not only do the manufacturers want more space each year to exhibit their cars in, but the ever-increasing demands of the accessory people make the erection of a more commodious exhibition building almost a necessity.

Manager W. M. Sweet, of the Motor and Accessory Manufacturers, in discussing this question, said: "Last year our association took 14,500 square feet of space in the Palace show, which was divided between 89 exhibitors. This year we have 103 members who will exhibit at the Palace show, and could use at least 20,000 square feet of space, yet all we can secure is 14,870 square feet, or about the same as last year.

"Our association is composed of the manufacturers of motors, motor parts, appliances or accessories used on or in connection with motor vehicles of every description. This includes tires, lamps, axles, motors, transmissions, gears, roller or ball bearings, shock absorbers, speedometers, springs, tops, carburetors, oilers, timers, batteries, radiators, hoods, etc. In fact, from the ranks of our members one could obtain all the material necessary for the construction of any type of machine on the market, provided we would sell them parts, which could not be done, as we cannot make quarter enough parts now to supply the legitimate needs of the automobile manufacturers."

As usual, all the exhibitors at the Palace show will be supplied with a distinctive sign for their booth in harmony with the general scheme of decoration adopted for this year's show. Unitt & Wickes, who have the decorations in charge, have designed a special sign which, in some form or other, will be used throughout the entire building. Standards of trellis work will support alabaster glass signs in which the firm's name will be printed in Egyptian letters of gold on a green ground, which will be illuminated from the rear by colored electric lights.

NOVEL RATHSKELLER FOR GARDEN SHOW

What promises to be a revelation in the rathskeller line is promised for the Tenth National Automobile Show at Madison Square Garden, January 8-15. Every nook and cranny of the historic building has been considered in the scheme of decoration, and those who have been privileged to see the decorative scheme adopted for the forthcoming show say that the big amphitheater will present a scene of unsurpassed grandeur that will make it unrecognizable to its regular patrons. The basement, where the commercial vehicles and motorcycles are to be on view, will be decorated more attractively than ever before and here, buried among dangling foliage, the rathskeller will be found. The rathskeller is of the Dutch Colonial type and is painted in cream white. The entrance with its two Doric columns is unique, and it is said that there is nothing along New York's "great white way" to compare with it. Crimson and green ramblers, clinging to lattice work effects adorn the edges of the inn and autumnal foliage trails to the top of it, on both sides of the entrance. There is a passageway on either side of the inn and a glimpse of what is within its walls can be had by peeping through the old-fashioned windows. Bay trees in boxes adorn the base of each column in front of the inn.

MILWAUKEE CLUB DECIDES SHOW DATE

MILWAUKEE, WIS., Nov. 8—The Milwaukee Automobile Club has practically decided on February 22 to 27 as the date for the second annual Milwaukee automobile show, and an option has been taken for that time on the new $500,000 Auditorium. The show committee consists of Lee A. Dearholt, Dr. Louis Fuldner, Christian Schlotka, Oscar A. Fischedick and A. C. Brenkle. The Auditorium is regarded as an ideal place for an automobile show, having an immense oval arena surrounded by seats. The building covers an entire block, including many smaller halls which can be used for accessory exhibits. Additional space here will allow twice the size of show that was possible last year.

MID-OHIO PLANS FOR AUTOMOBILE SHOW

COLUMBUS, O., Nov. 8—Arrangements for the automobile show to be held under the auspices of the Columbus Automobile Club December 25 to January 1, are progressing satisfactorily. More than half of the available space has already been contracted for, and the rest is going fast. In addition to the manufacturers represented in Columbus, a number of others have applied for space, and accessories will also be exhibited.

STATE AID FAVORED BY NATIONAL ROAD CONGRESS

COLUMBUS, O., Nov. 8—That the principle of State aid for the improvement of highways should be adopted in every locality in the United States was the consensus of opinion expressed by the 2,500 delegates that attended the National Congress of Road Builders and the annual meeting of the American Road Makers' Association, which closed their sessions October 29, after four days of instructive deliberation in this city. While no formal resolution to that effect was adopted, the leaders in the good roads movement from every State of the Union favored the plan. Men who have taken a prominent part in highway supervision and construction in many States spoke of their experiences and gained ideas from others.

The meeting was the largest good roads congress ever held in the Middle West, and probably in the United States. Delegates from practically every State which has a highway commission and many from other States and territories were in attendance, and exchanged views.

One of the features of the meeting was the address of Samuel H. Hill, an adopted son and son-in-law of James J. Hill, the Western railroad magnate. He hailed from Seattle, Wash., and delivered a long talk on "Blazing the Way on the Pacific Coast." Mr. Hill advocated the employment of convicts in road building, and believes that the highways can be improved with less cost in that manner. He told of the experience of himself and associates six years ago securing convicts to build Washington roads.

Addresses were made by James H. MacDonald, State highway commissioner of Connecticut; John Bristow, State highway commissioner of Rhode Island; Horatio S. Earle, State highway commissioner of Michigan; Charles P. Light, State highway commissioner of West Virginia; S. P. Hooker, chairman of the commission of State Highways of New York; R. D. Beeman, assistant highway commissioner of Pennsylvania; Paul D. Sargent, State highway commissioner of Maine; J. C. Wonders, State highway commissioner of Ohio; Fred H. Caley, State registrar of automobiles for Ohio, and a number of others of note.

One of the matters of interest considered by the meeting was the question of freight rates on road making materials. A resolution was adopted directing the president to take up the matter with the railroads, and see if a lower rate could not be obtained, the present tariffs being much too high.

Hundreds of delegates inspected the large exhibits of road-building machinery and materials at the State Fair Grounds, where part of the sessions of the congress were held. The demonstration of a water-bound macadam highway in process of construction under the charge of the county engineer also attracted widespread attention.

One of the most important projects which will receive the support of the Ohio Good Roads Federation is the Alsdorf county aid bill, with the new provision for perpetual maintenance. The State association urged the appointment by the governor of a perpetual commission to have charge of the State's highways. This latter plan was opposed, however, by the larger convention, the Road Makers' Association.

The annual election of officers of the American Road Makers' Association resulted in the re-election of James H. MacDonald, of Hartford, Conn., president; Samuel H. Hill, Seattle, Wash., vice-president; E. L. Powers, New York, secretary, and Joseph W. Hunter, Harrisburg, Pa., treasurer. A number of cities are desirous of having the 1910 convention, the place and date for which will be fixed by the executive committee.

Delegates to the international road congress to be held in H. MacDonald, E. L. Powers, S. H. Hill and A. C. Campbell.

SOUTHERN AUTOISTS FORM STATE BODIES

Three new clubs were elected to membership in the American Automobile Association at the regular monthly meeting of the executive committee, held recently at national headquarters, 437 Fifth avenue, New York. They were: Atlanta Automobile Association, of Atlanta, Ga.; Waco Automobile Club, Waco, Texas, and the Rowan County Automobile Club, Salisbury, N. C. At the same time favorable reports were received indicating that active work is progressing toward the formation of State associations in Texas, North Carolina, Alabama and Florida. Secretary B. M. Reed, of the Tampa Club, stated that automobile interest was increasing rapidly in all parts of Florida, and the clubs that are likely to be affiliated with the State body will be the Tampa, Daytona, De Land, Orlando, Bartow, Brookville, Ocala, Gainesville and Jacksonville local organizations.

President Lewis R. Speare, of Boston, who presided at the meeting, announced the appointment of Ralph W. Smith, president of the Denver Motor Club, also president of the Colorado State A. A., as a member of the A. A. A. executive committee.

Secretary Frederick H. Elliott was instructed to make arrangements for the customary reduced railroad rates for A.A.A. members desiring to attend some of the meetings to be held in New York City during the coming two big automobile shows, the Grand Central Palace show from Dec. 31 to Jan. 7, and the Madison Square Garden show from Jan. 8 to 15.

THANKSGIVING CLIMB ALONG THE HUDSON

OSSINING, N. Y., Nov. 8—The Upper Westchester Automobile Club will hold a hill-climb on Thanksgiving Day, November 25, on a one-mile course over Sunset Hill, near this city. There will be seven classes, open to all, arranged by price classificatiions and with divisions for stripped chassis and steam cars, as well as a free-for-all. Entries close November 23, with a $4 fee.

VANDERBILT WINNER IS DINED AT THE HUB

BOSTON, Nov. 6—In recognition of the fact that two of the three winners in the Vanderbilt Cup race were Boston men, the Bay State Automobile Association this evening gave a banquet in honor of Harry Grant and Joseph Matson, drivers, respectively, of the Alco that captured the Vanderbilt Cup and of the Chalmers-Detroit that won the Massapequa trophy. Mr. Grant was present, but Mr. Matson was obliged to leave for Atlanta for the races on the new speedway and so could not attend. He was represented, however, by A. E. Gilmore, Boston representative of the Chalmers car. Frederic Tudor, president of the Bay State Association, presided, and with him at the head table, besides Mr. Grant, was L. R. Speare, president of the American Automobile Association. About fifty members of the club were present. Gold fobs bearing the emblem of the Bay State Association, were presented to Grant and to Mr. Gilmore, representing Matson. The speakers included the guest of honor, President Tudor, Mr. Speare, James Fortescue, Frank E. Wing, representative of the Marmon that won the Wheatley Hills trophy; Charles J. Glidden, J. W. Bowman and A. E. Morrison.

DINNER DAY CLIMB OPPOSITE NEW YORK

New York dealers have promised their support to the proposed Edgewater-Fort Lee hill climb, on the Jersey side of the Hudson, and this event is now assured for Thanksgiving Day. The climb will be conducted by the Edgewater Motoring Society. The provision in the New Jersey laws forbidding racing will, it is said, be dodged by sending the cars up one at a time, so that, legally, they will not be racing. The trials will begin at 10 a. m. and will end by noon. W. J. Morgan is the New York representative, at his office in the Thoroughfare Building. A big delegation from New York is expected to attend.

AMONG THE BUSY FACTORIES IN THE BADGER STATE

RACINE, WIS., Nov. 7—Without going to Wisconsin and visiting such centers as Racine, it will be impossible to realize the extent of the automobile invasion. Wisconsin is an ideal center for this industry, and besides an abundance of skilled labor there is material to be had, and many natural advantages besides business acumen.

The Mitchell Motor Car Company, not going back more than three years, shows progress that may be set down as follows: Cars constructed during 1908, 1,800; and in 1909, 3,200. For 1910 the output is estimated to be 6,000, for which material is now in hand on a basis of 85 per cent. The value of the Mitchell product for these years was estimated by the company as follows: 1908, $2,000,000; 1909, $3,500,000, and for 1910 it is expected that the output of the company will foot up to the comfortable sum of $7,500,000. The number of men employed during the last three years may be approximated as follows: 1908, 500; 1909, 1,000, and this force has increased to 2,500. with the chance that it will be augmented considerably in the near course of events. All cars up to the limit of the output, in view of the machine tools actually in hand, have been sold and there are demands which may be satisfied, in excess of the expected output of about 1,200 cars. At the plant, everything is made excepting tires, magnetos and some unimportant small parts. The plant spreads over considerable space, increasing from 3 acres in 1908 to 6½ acres in 1909, and 13 acres at this time, counting floor space; the grounds spread over some 40 acres and expansion is therefore but a matter of continuing the Mitchell brand of activity.

Pierce Motor Car Company, having added 36,400 square feet of floor space, thus bringing the plant up to 96,400 square feet, has 500 of the new Model K, known as the Pierce 30, under way, and while the plant is just as busy as the management can make it, the question of the exact number of cars, over and above the number as here indicated, is a matter which can not be stated with certainty. At all events the Pierce is a "built" car, and this means much, since the amount of work to be done in the shop of the maker is enormously increased over a parts undertaking.

Racine Manufacturing Company, with 12,000 bodies to its credit for last year, is now turning out 100 bodies per day, and at is claimed by the management that this rate will be increased to 125 bodies per day within three months. It is stated that the trend is in the direction of metal bodies, using steel, and ash framing is being continued as the most reliable wood to employ, having in mind the necessity of properly joining and "ironing" the framing. Aluminum and wooden bodies are made by this company as well, and it is noteworthy that the taxicab business is having a vast influence on the amount of work in hand and in prospect.

KENOSHA, WIS., Nov. 8—Thomas B. Jeffery & Company, authoritatively announce that all the 1910 Rambler models will be designated as "The New Ramblers." This name has been chosen, it is said, to call attention to the success of the Rambler makers in their effort to make the new models more distinct even than their predecessors in point of quality, dignity, silence, and comfort.

The Badger Brass Company, maker of lamps, generators, and lighting equipment in general for use in automobile work, invited THE AUTOMOBILE representative to stay a few days and get a line on the class of work which is being done. It will be impossible to fairly depict the situation without doing so, and this detailed inspection is to take place early in November. In the mean time it is fair to say that the company is pushing work as fast as quality will admit of, and the line for 1910, which is well disposed of, will offer evidences of novelty in the contemplated description.

HUSTLING ILLINOIS TOWN HAS AUTO BOOM

SYCAMORE, ILL., Nov. 6—In the midst of a rich farming land, the town of Sycamore occupies a strong position, and while trade is the more important occupation of the residents, even so, manufacture is making inroads, and among the more prosperous of the industries of the town will be found the Turner Brass Works, makers of a hundred varieties of gasoline torches, some of which are especially for automobile work. With a foundry of competence, the company is turning out a line of brass and aluminum of every description, and the great variety of name plates made, for illustration, is worthy of note. Then, the "Harroun" auto bumper is a company product, and for this well-known device the demand is so great that the makers are having difficulty in keeping up with orders.

Sycamore will soon bask in the sunlight of a great new automobile project. The Fidelity Motor Car Works, with a plant of some pretence available, and plans in a large way under discussion, will place before discriminating buyers of commercials, a line of commercial vehicles, which, for up-to-date features, will represent the top of the designer's ingenuity.

TRADE CHANGES IN OHIO'S CAPITAL

COLUMBUS, O., Nov. 8—The F. H. Lawell Company, which has been handling the Franklin, will be succeeded by the Franklin Motor Car Company, to be located at Spring and Fourth streets. The new company will also handle the Reo. F. H. Lawell remains general manager. The Speedwell Company, of Dayton, O., will open an agency about January 1 near Spring and Fourth streets, to be in charge of Kimmel Bros., of Dayton. Frank Corbett, representing the Maxwell in central Ohio, will move about December 1 to a new salesroom which will be located at 58 East Spring street.

EAMES TOURING STUDEBAKER BRANCHES

CLEVELAND, Nov. 8—Hayden Eames and Le Roy Pelletier, general manager and advertising manager, respectively, of the Studebaker Automobile Company, have during the past month been making an extended tour of the various Studebaker branches, covering over 15,000 miles. The itinerary included Salt Lake City, San Francisco, Portland, Seattle, Minneapolis and Chicago.

Mr. Eames says that to an even greater extent than last year the automobile manufacturers' problem is to meet the demand, which is particularly strong for the medium-priced cars. Even if the 200,000 cars which are predicted for next season could be built, the supply would still be inadequate. However, Mr. Eames, from his knowledge of the material and parts markets, believes that this prediction is far too high, and that the correct figure will be found about 125,000—certainly not over 150,000 cars. The Studebaker-E. M. F. factory in Detroit is now turning out about 1,200 cars a month.

During the present week Messrs. Eames and Pelletier will continue their tour, visiting New York, Boston and Philadelphia, and concluding at the Atlanta show.

AUTOS INCREASING IN BLUE GRASS CITY

LOUISVILLE, KY., Nov. 8—The automobile business is having an awakening in this city. Heretofore Louisville has been very slow to buy cars, and its prominence as a distributing center has been due to the manufacturers' distribution of territory; some of the local establishments handle the entire business of their companies south to the Gulf of Mexico. Things seem to be changing now, for at the same time that the manufacturers are making more local Southern agencies the people of the city are buying more cars. There are at present twenty-two branches or agencies in the city, representing fifty makers.

DETROIT'S LATEST TO MAKE PARTS

DETROIT, Nov. 8—The Metal Products Company, just incorporated, with a capital stock of $200,000, all of which has been subscribed, is the latest concern to invade the local automobile parts field. The main product will be automobile axles, delivery of which will begin early next Summer.

The company brings to Detroit men of high standing elsewhere, who have been attracted to this city by the exceptional opportunities afforded in the line in which they have embarked. E. E. Keller, president of the new organization, was a former vice-president of the Westinghouse Machine Company, and with J. H. Hunter came here from Pittsburg three years ago, establishing the Detroit Insulated Wire Company. With them in the new company are W. F. Evans, recently with the Westinghouse Company, and H. L. Barton, both of Pittsburg, and E. E. Arnold, who comes from Buffalo. Mr. Barton is vice-president and Mr. Evans manager of the plant.

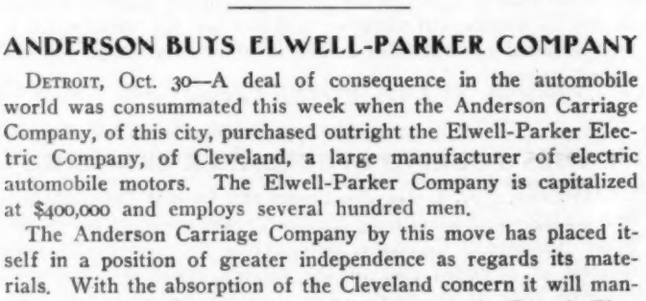
ATLAS PROTESTS VANDERBILT DECISION

First place in Class 2 in the Vanderbilt Cup race has been claimed by the Atlas Motor Car Company for its entry. Class 2 is for cars rated from 301 to 450 cubic inches piston displacement, and was combined with Class 1, contesting for the Vanderbilt trophy itself. In addition a special trophy was offered for the winner in Class 2. This trophy was not awarded on the ground that no car had finished in that class; Chalmers-Detroit No. 7 completed but 19 laps, and the Atlas was running on its fifteenth when the race was called. The Atlas company contests the decision not to award this trophy, and claims it, if awarded, on the ground that the Chalmers-Detroit was out of commission at the time the race was called. The Atlas company has filed a formal protest with the Motor Cups Holding Association.

ANDERSON BUYS ELWELL-PARKER COMPANY

DETROIT, Oct. 30—A deal of consequence in the automobile world was consummated this week when the Anderson Carriage Company, of this city, purchased outright the Elwell-Parker Electric Company, of Cleveland, a large manufacturer of electric automobile motors. The Elwell-Parker Company is capitalized at $400,000 and employs several hundred men.

The Anderson Carriage Company by this move has placed itself in a position of greater independence as regards its materials. With the absorption of the Cleveland concern it will manufacture practically every part of its product, the Detroit Electric, with the exception of wheels and tires.



Pretty Good Trip for an Eleven-Year-Old Pilot

"Piloted by little eleven-year-old Archie Smith, a big Stoddard-Dayton touring car swung into San Antonio yesterday afternoon, on the completion of a long overland trip from Denver, a distance of 1,385 miles by the speedometer."—San Antonio Daily.

BOSTON MOTOR CLUB DISBANDS

BOSTON, Nov. 6—The Boston Motor Club, which was organized last spring in the main by some of the members of the Bay State Automobile Association, dissatisfied with the conduct of motoring affairs by that organization, is going out of existence. The officers and directors of the Motor Club, after deciding that there is no field for another motoring club similar to the Bay State, and that that organization fills the field satisfactorily, voted to liquidate the affairs of the Motor Club. Consequently the members have been given the option of receiving back their money, minus a small percentage used for expenses, or having the money turned over to the treasurer of the Bay State Association as payment for admission to that association. The expenses of the club have been small so only a small part of the original payments has been deducted. Many members of the Motor Club have already applied for admission to the Bay State Association.

NEW RECORDS EXPECTED AT NEW ORLEANS

NEW ORLEANS, Nov. 8—Work began to-day on the mile race track at the Fair Grounds in preparation for the Good Roads automobile race meet to be held November 20-21. The course will be scraped of all its present top soil, until only the "buckshot" black loam is left. Then that will be oiled and made perfect for such record-breaking fast time as was made over the course last February. Arrangements were made last week with Capt. W. H. Hardee, city engineer, for the use of the city road repair forces for this work. This meet is being held by the New Orleans Automobile Club in connection with the first Louisiant Good Roads Convention, called by Gov. J. Y. Sanders, the New Orleans Progressive Union and the automobile club.

George Robertson, winner of the 1908 Vanderbilt Cup, the 1908-09 Fairmount Park races, the Lowell National Cup and two 24-hour Brighton Beach races this year, will compete. One of the certain starters against Robertson will be Lewis Strang, his oldest rival, who will drive the Vanderbilt Cup race Fiat.

QUARTERLY DIRECTORY BIGGEST EVER

With the quarterly issue of the *Automobile Trade Directory* dated October, the publishers of this excellent and very handy work have reached a point where further increases will be sure to result in the division of the volume into two parts. In the October issue, just off the press, the 1 1-2-inch thick volume includes some 40 or 50 pages of additional matter.

This added amount of space is divided about equally between the alphabetical lists, which have an increase of 22 pages, and the geographical section, which has the rest. This latter feature, introduced in the July issue, has proved of such sterling worth that it will be retained for all time. The arrangement of the subject matter is about the same as before, access to it being facilitated by three indices, located in the front of the book. These are: the index to advertisers; index to classifications, and index to tables and data for engineers.

Although the latter, as the name would indicate, are primarily for engineers, much of it is such as would be constantly referred to by every one. Thus, every one is interested in the horsepower of automobile engines and ready means of figuring out the same—six pages are devoted to this subject. So, too, with the matter of speeds, not everyone can figure these out quickly, yet everyone wants to know about speed—six pages of handy tables are given over to this subject.

Over and beyond all this, the real purpose of the directory is to furnish complete and accurate lists of the manufacturers and dealers in different lines of business closely related to the automobile business. In this, there can be no question either of its thoroughness, the care with which it is compiled and edited making for extreme accuracy. It is published by the *Automobile Trade Directory*, Inc., at 231-241 West Thirty-ninth street, New York City.

News in General

On the Way from Uniontown, Pa., to the Mountain's Summit

Party with 42-horsepower, six-cylinder Franklin touring car, making the climb from Uniontown. The rise is 1,400 feet in a distance of three miles

Suit to Protect Cadwell Patent—Action has been instituted against the Rapid Safety Company, of New York, for alleged infringement of patent on an automobile cushion tire granted to Edwin B. Cadwell, and licensed exclusively to the Swinehart Clincher Tire & Rubber Company, of Akron, O. The infringing tires in question were manufactured by the Motz Clincher Tire & Rubber Company, also of Akron. The Swinehart Company, through its legal representatives, have notified the trade in general that it is its contention that any cushion tires having recesses in their sides, and presenting an unbroken tread surface, is an infringement of the said Cadwell patent, and that persons buying, dealing or using same will be held as infringers by the owners of said patent.

Making Tires for Aeroplanes—Taking time by the forelock, the Hartford Rubber Works Company has brought out a line of pneumatic tires especially designed for aeroplane use. These are made in three weights, known by the trade names of "Aviator," "Aeroplane" and "Aeronaut," for light, medium and heavy machines respectively. These tires are single-tube, and differ from bicycle tires principally in their sizes, which range from 18x1 1-2 to 28x3. In the construction of these tires it is claimed that the conditions under which they work have been carefully studied, with the view of obtaining great resiliency, together with the ability to withstand the shocks of alighting.

Japanese Visit Auto Factory—When the members of the honorary commercial committee of Japanese merchants, financiers and legislators visited Syracuse, N. Y., on their trip through the United States one of the points visited was the factory of the H. H. Franklin Mfg. Co. The party was shown the various operations in the making of the Franklin car, from the manufacture of the smallest parts to the finished machine. One of the developments which the members of the party expect as a result of their trip is an increased use of autos in Japan.

Mitchell Spreading Abroad—In the year of its organization, 1904, the Mitchell Motor Car Company built eighty cars, and a steady yearly increase has brought the output in 1909 to 2,500. Cars have been shipped to the Philippine Islands, South America, Australia and several other foreign countries, and the Mitchell catalogues are printed in French and Spanish as well as in English. Recently, also, a branch has been established in Paris at 20 Rue de Tilsitt, and in London, and an exhibit will be maintained at the Olympia Show.

Reo Challenges Tourists—R. M. Owen, who drove the new four-cylinder Reo in the New York-Atlanta good roads tour, has challenged the other perfect-score cars to submit to a technical examination to determine the real winner. Each car, after checking out at Atlanta, is to be delivered to a comimttee headed by Referee Scarritt, to make an examination under rules which it shall itself make. Repairs or replacements made on the route, or which may be necessary to restore the car to perfect condition, are to be charged against each.

Seven Molines in Kalona—The Moline Automobile Company has received a letter from J. W. Southwick, of Kalona, Ia., telling of his experiences with his Moline Model M. According to Mr. Southwick, there are seven other Molines in his neighborhood, all in the hands of inexperienced farmers, and all are giving perfect satisfaction. He further says that during the several months he has had the car he has had no expense for repairs. This seems to vindicate the Moline Company's policy of devoting especial attention to the country trade.

Toledo to New York Overland—Seven hundred miles through sand and mud in 40 hours' running time is the record of an Overland runabout driven by George L. Riess, the New York agent for the Willys-Overland Company. The trip was made on the spur of the moment, a new car just from the factory being used, without any special preparation. The trip from Toledo to Cleveland was made in 4 hours 5 minutes, over roads in some places deep in sand. The next day's run was to Westfield, N. Y., 6 hrs. 30 min.

Morgan Trucks Increase Stock—The capital stock of the R. L. Morgan Company, of Worcester, Mass., was increased at a recent meeting of the stockholders to $1,000,000, of which half is 7 per cent cumulative preferred and half common. This follows on the big South African contract recently made; the company, altogether, it is said, has signed contracts for 121 trucks. One trial order has been received from the Curtis-Blaisdell Company, of New York, which may result in the ordering of 30 or 40 more. The increased capital will enable the company to make all its own parts.

Badger Wins Patent Case—The Badger Brass Mfg. Co. announces a decree sustaining patent No. 841,799, granted to Geo. Maris and Besnard, Maris & Antone, of Paris, January 22, 1907, for improvements in automobile lamps. The suit was brought against Herman Saxon in New York City and the usual perpetual injunction was granted against him and his agents.

Moon Tours in Texas—E. J. Moon left the St. Louis factory recently for Texas, taking with him one of the first 1910 Moon Thirties. He will make an extensive trip through the State by road, winding up at San Antonio. The object of the tour is of course to demonstrate the adaptability of the small car to the roads found in that part of the country. The Moon output for the coming season is estimated at 1,500 cars, an increase of 100 per cent over last year. Each car receives a 220-mile road test.

Lexington Stays in Lexington—Lexington and Georgetown, Ky., capitalists, represented by A. G. Morgan, have secured an option on the controlling interest of 340 shares in the Lexington Motor Car Company, held by G. D. Johnson, of Connersville, Ind. Mr. Johnson had planned to remove the Lexington plant to Connersville, and the plan to buy his stock was formed by the Lexington Commercial Club to keep the plant in that city. The option sets the purchase price at 115 per share.

Portola Race on Fisk Tires—The Pope-Hartford driven by Jack Fleming, which won the 258-mile Portola race, at Oakland, Cal., in 238 minutes, was equipped with Fisk tires. The car made the run, at an average speed of 64.7 miles an hour, without any tire trouble whatever on the road. Three of the car's shoes were changed near the end of the race as a precaution, but the other shoe and its tube went through the whole race and finished in good condition.

Friction-Drive Patent Suit—The Cartercar Company, of Pontiac, Mich., has commenced suit against J. B. McIntosh, as agent, and the Buckeye Mfg. Co., of Anderson, Ind., maker of the Lambert, as principal, for infringement of the Carter patent, No. 761,146, dated May 31, 1904. Proceedings were begun in the United States Circuit Court at Detroit through Parker & Burton, who have been prominent in the litigation over the Selden patent.

New Owen Thomas Company—Capitalists controlling the Wisconsin Engine Company, at Corliss, Wis., have purchased the patents and rights of the Owen Thomas Motor Car Company, of Janesville, Wis., and will engage in automobile manufacturing. The holding company is capitalized at $500,000. No announcement of the location of the prospective factory has been made, but it is expected that it will be near Corliss.

Goodyear Gets Big Contract—What is said to be the largest tire contract ever made in this country was made recently

between the Goodyear Tire and Rubber Company and the Buick Motor Company. It is estimated that the Buick Company will make 40,000 cars during the coming season, and Goodyear quick-detachable tires and rims will be their standard equipment.

Ajax, New York to Atlanta—The latest performance of Ajax tires was on the New York to Atlanta tour, in which five cars had this equipment. Not a single Ajax casing was replaced during the tour, and the twenty tires only had three punctures. Every casing, it is said, was in condition when it reached Atlanta to turn around and make the trip back to New York.

Standard Roller Bearing Officers—At the meeting of the directors of the Standard Roller Bearing Company in Philadelphia Lenox Smith was elected president, Osgood Field vice-president, R. S. Woodward, Jr., general manager, and W. M. Baldwin secretary and treasurer.

IN AND ABOUT THE AGENCIES

Great Western Agencies—The Great Western Automobile Company, of Peru, Ind., announces that it has made contracts with the Sheldon Automobile Garage, Sheldon, Ill.; J. F. Metzler, Helena, O.; C. A. Kenney, Nicholasville, Ky.; H. O. Vogel, 1610 South Main stret, Los Angeles, Cal.; Geo. H. Peddle, Perry, N. Y.; the Albert Sterne Motor Car Company, St. Louis, and O. B. Shutt, Peru, Ind., all of whom will handle the Great Western exclusively.

Apperson, Philadelphia—The branch-house habit struck the Apperson plant in Philadelphia last week, and hereafter the car will be represented in the Quaker City direct from the factory, with Alexander M. Benson, formerly head of the local agency, as general manager and Harry Jones, from the factory, as his assistant. There will be no change in location, the present quarters at 620 North Broad street being admirably adapted to the purpose.

Palmer & Singer, Philadelphia—George Parker, manager of the Philadelphia agency of the Palmer & Singer car, has secured the corner section of the new concrete building now in course of erection at Broad and Callowhill streets, where he will open well-equipped quarters soon after the first of the year.

Studebaker, Brooklyn, N. Y.—The Studebaker Company has chosen the Carpenter Motor Vehicle Company to act as its representative in this borough of the metropolis, with quarters at 1239 Fulton street.

Parry, Velie and Demot, Toledo, O.—The Norris-Toledo Motor Sales Company has been formed in this city to represent the Parry, Velie and Demot runabout, with salesrooms at 623 Madison avenue.

Stoddard-Dayton, Harrisburg, Pa.—The Cox Automobile Company, the local agent for the Stoddard-Dayton, is now located in its new building at 23 South Fourth street.

Empire "20," Philadelphia—The Motor Supplies Company of Philadelphia, which a fortnight ago secured the local agency for the Empire "20," has taken over the old Acme quarters at 608-610 North Broad street.

Autocar, San Francisco—Walter Morris, who is the local representative for the Autocar, is now installed in his new salesroom on Golden Gate avenue.

Lexington and Parry, Providence, R. I.—The Nock Auto Company, of this city, now represents the Lexington and Parry cars, with salesrooms at 486 Broad street.

Ford, Streator, Ill.—The Pontiac Motor Car Company, the latest addition to the local field, will handle the Ford and in addition make a car of its own.

Martin Commercial, Philadelphia—D. P. S. Nichols, Broad street above Vine, is handling the Martin Commercial delivery car in the Quaker City.

PERSONAL TRADE MENTION

P. J. Dasey, who has been identified with the automobile business since its inception, and who for several years past has been eastern manager for the Motsinger Device Manufacturing Company, has been appointed sales manager of that concern and is now located at the factory at Pendleton, Ind. R. S. Bryan has been appointed eastern manager, with his office at 31 West Forty-second street, New York City.

J. C. Matlack, who has been vice-president and manager of the Michelin Tire Company, of Milltown, N. J., since its inception in 1907, has resigned his position with that company. No announcement has been made of Mr. Matlack's future plans nor of his successor.

N. Lazarnick, the photographer, has removed his place of business from 29 W. 42nd street, New York, to more commodious quarters at 246 W. 42nd street, on account of increased business and the desire to include other and broader fields of photography.

Flavius Sudrow, formerly secretary and treasurer of the National Battery Company, has secured the exclusive sales rights in the United States for a device known as the American Auto Heater, and is located at 15 West Swan street, Buffalo, N. Y.

C. Royce Hough, formerly with Fickling & Company, New York, has returned to Washington, D. C., as sales manager of the General Motor Company's distributing branch for Maryland, Virginia and North Carolina.

Jesse Froehlich, managing director of the Benz Auto Import Company, sailed for Europe on the *Amerika*. He will visit the London automobile shows and then go to the Benz factory at Mannheim, Germany.

Stanley A. Allen has left the Packard Motor Car Company of New York to accept the position of general manager of Fickling & Company, of New York, manufacturer of auto bodies and tops.

F. R. Bump, sales manager; J. E. Walker, advertising manager, and R. H. LaPorte and L. E. Hoffman, salesmen, are representing the H. H. Franklin Mfg. Co. at the Atlanta show.

GOODRICH NEW YORK BRANCH MOVES

The B. F. Goodrich Company of New York has moved its entire business from 66 Reade street and 1625 Broadway to its new twelve-story building at 1780 Broadway, which has been illustrated in these columns. Commodious reception rooms have been provided for the accommodation of visitors. W. H. Yule remains in charge as manager and H. C. Miller superintends the tire department.

A NEW METROPOLITAN AGENCY

The Colt-Stratton Company has been formed to handle the Cole "30" and the Paige-Detroit roadster in New York City and vicinity, and is located at Broadway and Sixty-eighth street. William L. Colt, ex-president of the Cleveland Motor Car Company, and later advertising manager of "Hampton's Magazine," heads the concern. Harry L. Stratton, vice-president and treasurer, was formerly with the Amalgamated Copper Company. The Paige-Detroit is a newcomer from Automobile City.

PACKARD'S NEWARK, N. J., STORE

NEWARK, N. J., Nov. 8—The Packard Motor Car Company of New York has opened a new salesroom on Branford Place, Newark, which it will operate as a branch office. The building is fireproof, of reinforced concrete and brick construction. The main office is finished in mahogany in simple style. The main floor contains a stock room, where a complete supply of parts for all models of Packard cars is maintained, and a repair department. L. Fitzgerald, formerly of the New York office, is in charge.

New Salesroom of the Packard, on Branford Place, Newark, N. J.

Information for Auto Users

Extra Hard Anti-Skid Device—The latest anti-skid device to be placed on the market with the coming of winter is known as the Traver Non-Skid Device, and is manufactured by the Philip Traver Mfg. Co., Far Rockaway, N. Y. The manufacturer is so confident of the quality of this device that he guarantees it to run 1,000 miles without showing any appreciable wear. The non-skids are curved pieces of doubly hardened steel spaced around the tire. The edges are flared, both to increase the non-skidding properties and to make impossible the cutting of the tread of the tire. A strong spring attachment on the side members of the device prevents the chains from coming loose, rattling, and losing their efficiency. This spring device is operated by a simple wire lever, so constructed that the non-skid pieces are held firmly and evenly against the surface of the tire. This is one of the best features of the Traver product.

TRAVER NON-SKID DEVICE

In addition to the non-skid device made up as one chain, the company manufactures what it calls a sectional non-skid device. This utilizes the same principle as the complete chain, differing in that each piece is put on individually and held in position by rubber-guarded chains which fasten to the spokes. A wheel may be equipped with as many or as few of these as conditions require. All of the tread pieces which take the wear are doubly hardened by a secret process, the result being a surface so hard that a file will not scratch it.

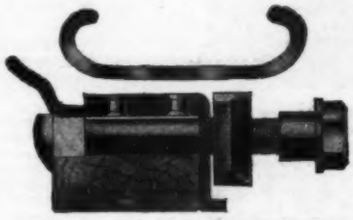
New Paste Makes Valve Grinding Easy—A new substance recently put on the market with the idea of saving motorists labor, material, and money in valve grinding, is being manufactured by the Victor Auto Supply Mfg. Co., 42 West Forty-third street, New York, and is known as Vasco Grinding Compound. In the past, many car owners have experienced repeated trouble with valves that have been improperly ground by the old method, employing oil and emery. Aside from this being an expensive process, it has been found by experts to be highly injurious in many cases. Vasco Grindine has been prepared to eliminate the dangers of emery, and machinists who have tried it find that it does so most efficiently. The abrasive in the compound is an electro-chemical product and was selected over all others owing to its extreme hardness, sharpness, and temper. The binder used has a high viscosity and produces a smooth, even surface. Conveniently put up in collapsible tubes, both coarse and fine, the preparation always remains at the right consistency. One of the chief virtues is that it does not waste away or drop into the cylinder during the process of grinding. It also cuts more rapidly than any other compound.

What's in a Name?—The old saying, "What's in a name?" will be clearly proven as to truth or falsehood in a few short months by one New England concern, the Dover Stamping & Mfg. Co., of Cambridge, Mass., which is now asking the public to give a name to the latest output of the factory. This is an improved funnel, which not only is effective as such, but a great fuel saver in that it is so made as to automatically cut off the outflow of gasoline when the top level is reached. In this way the surplus poured into the funnel may be poured back into the fuel can and saved. The way in which this is accomplished without complications is interesting. Within the funnel is a ball, which is held up off of the outlet hole when the funnel is in use, but as soon as the funnel is raised this ball drops back and covers the hole so that no more liquid can flow through. Those who have had experience with the overflow running all over the floors, seats and other parts of the car will appreciate this new device at its full worth. And still the contest is open for the $50 which will be paid for a good, suitable name. The cut is partly sectioned and shows construction.

DOVER (NAMELESS) GASOLINE FUNNEL

New Removable Rim and Tire—To be able to make a tire change on the road in from two to three minutes, and that with little or no exertion and without getting the hands dirty, is the function of the removable rim. Among those put on the market with this idea in view is the new rim brought out by the Empire Tire Company, Trenton, N. J. This newest addition to the rim family, as shown by the two figures on this page, has a clincher rim, which bolts to the wheel by means of eight bolts. Only six of them, however, must be loosened to make a change, the bolts on each side of the valve being left tight at all times. When the bolts have been loosened the lug is turned over to present the short side to the tire and rim, which may then be pulled off. The new Empire tire, which will be exhibited at the Atlanta show for the first time, has an unusual tread. This has been given the name of "checkered" by the makers, as that indicates the shape and condition of the raised tread portion. The tire is of the same heavy, moulded construction as all other Empire tires, but the new addition, the checkered tread, renders the tire non-skidding. The showing of this new tread at this show, just at this time, when winter is coming on, is particularly appropriate, as this is the time when automobilists are interested in anti-skidding devices. The tire with a tread of this sort is a big advance over the removable and consequently bothersome type. This tread is seen in the illustration to be raised above the surface, so that the "checkers" are really added material.

EMPIRE REMOVABLE RIM ASSEMBLED



SCHEME OF ACTION OF EMPIRE RIM

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